ONLINE SUPPLEMENTARY APPENDICES

Supplementary appendix 1. Terminology

Conflicts of interest: any financial or non-financial conflicts of interest as specified below.

Financial conflicts of interest: any funding of clinical guidelines, opinion pieces, or narrative reviews by drug or device companies, or any authors or advisory committee members with ties to such companies (e.g. advisory board membership).

Non-financial conflicts of interest: any relationships that differ from what is typically regarded as financial conflicts of interest (i.e. relationships with the drug or device industry), regardless of the definitions used by the authors of the included studies. However, we did not include studies investigating beliefs (e.g. political or religious), personal experience (e.g. abuse or trauma), or institutional conflicts of interest.[1]

Drugs: medications that require approval from a regulatory authority.

Devices: instruments used in diagnosis, treatment, or prevention of disease.[2] This term also includes medical imaging technologies.

Clinical guidelines: *"Practice guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances".*[3]

Advisory committee reports: reports from meetings held in committees, boards, councils, or similar formalised groups that are established to advise an organisation and provide a recommendation concerning a drug or device intervention (e.g. records from the Food and Drug Administration (FDA) advisory committee on oncological drugs).

Opinion pieces: publications that are not research studies in which an author expresses a personal opinion about a specific intervention (e.g. editorials, commentaries, and letters).

Narrative reviews: literature reviews without a systematic search of the literature and without clear eligibility criteria.

Documents: clinical guidelines, advisory committee reports, opinion pieces, and narrative reviews.

Supplementary appendix 2. PubMed Search Strategy

Block 1A: drug and device industry

1. Drug Industry (MeSH)

2. Manufacturing Industry (MeSH)

3. (Drug [Title/Abstract] OR drugs[Title/Abstract] OR pharmaceutical[Title/Abstract] OR pharmaceutic [Title/Abstract] OR pharmacological[Title/Abstract] OR pharma*[Title/Abstract] OR biotech*[Title/Abstract] OR bio-tech[Title/Abstract] OR biopharma*[Title/Abstract] OR bio-pharma*[Title/Abstract] OR biomed*[Title/Abstract] OR bio-med*[Title/Abstract] OR device[Title/Abstract] OR devices[Title/Abstract] OR imaging[Title/Abstract] OR for-profit[Title/Abstract] OR private[Title/Abstract]) AND (industry[Title/Abstract] OR industries[Title/Abstract] OR company[Title/Abstract] OR companies[Title/Abstract] OR manufacturer[Title/Abstract] OR manufacturers[Title/Abstract] OR organisation[Title/Abstract] OR organisations[Title/Abstract] OR organization[Title/Abstract] OR organizations[Title/Abstract] OR agency[Title/Abstract] OR agencies[Title/Abstract] OR sector[Title/Abstract] OR sectors[Title/Abstract])

4. Personal[Title] OR self-reported[Title] OR selfreported[Title] OR author[Title] OR authors[Title] OR authorship[Title] OR ((committee[Title] OR board[Title]) AND (member[Title] OR members[Title])) OR voting[Title] OR votings[Title] OR financial[Title] OR finance[Title]

5. 1 OR 2 OR 3 OR 4

Block 1B: financial conflicts of interest

6. Conflict of interest (MeSH)

7. Financial support (MeSH)

8. Research support as topic (MeSH)

9. (Conflict[Title/Abstract] OR conflicts[Title/Abstract] OR conflicting[Title/Abstract]) AND (interest[Title/Abstract] OR interests[Title/Abstract])

10. (Competing[Title/Abstract] OR vested[Title/Abstract]) AND (interest[Title/Abstract] OR interests[Title/Abstract])

11. (Industry[Title/Abstract] OR industries[Title/Abstract] OR company[Title/Abstract] OR companies[Title/Abstract] OR manufacturer[Title/Abstract] OR manufacturers[Title/Abstract] OR finance[Title/Abstract] OR financial[Title/Abstract]) AND (funded[Title/Abstract] OR funding[Title/Abstract] OR sponsor[Title/Abstract] OR sponsors[Title/Abstract] OR sponsorship[Title/Abstract] OR sponsoring[Title/Abstract] OR support[Title/Abstract] OR supported[Title/Abstract] OR finance[Title/Abstract] OR financial[Title/Abstract] OR involvement[Title/Abstract] OR involving[Title/Abstract] OR payment[Title/Abstract] OR payments[Title/Abstract] OR relationship[Title/Abstract] OR relationships[Title/Abstract] OR relation[Title/Abstract] OR

relations[Title/Abstract] OR tie[Title/Abstract] OR ties[Title/Abstract] OR collaboration[Title/Abstract] OR collaborations[Title/Abstract])

12. Industry-funded[Title/Abstract] OR industry-funding[Title/Abstract] OR industry-sponsor*[Title/Abstract] OR company-funded[Title/Abstract] OR company-funding[Title/Abstract] OR company-sponsor*[Title/Abstract] OR industry-support[Title/Abstract] OR industry-supported[Title/Abstract] OR company-support[Title/Abstract] OR company-supported[Title/Abstract]

13. (Commercial-academic[Title/Abstract] OR academic-commercial[Title/Abstract] OR industry-academic[Title/Abstract] OR academic-industry[Title/Abstract] OR commercial-industry[Title/Abstract] OR industry-commercial[Title/Abstract] OR industry-physician[Title/Abstract] OR physician-industry[Title/Abstract]) AND (interaction[Title/Abstract] OR interactions[Title/Abstract] OR relationship[Title/Abstract] OR relationships[Title/Abstract] OR relation[Title/Abstract] OR relations[Title/Abstract] OR collaboration[Title/Abstract] OR collaborations[Title/Abstract])

14. 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13

Block 2A: non-financial, personal, and academic

15. Non-financial[Title/Abstract] OR nonfinancial[Title/Abstract]

16. Personal[Title] OR individual[Title] OR self-reported[Title] OR selfreported[Title] OR author[Title] OR authors[Title] OR authorship[Title]

17. Specialist[Title/Abstract] OR specialists[Title/Abstract] OR specialty[Title/Abstract] OR expert[Title/Abstract] OR experts[Title/Abstract] OR intellectual[Title/Abstract] OR intellectuals[Title/Abstract] OR professional[Title/Abstract] OR professionals[Title/Abstract] OR academic[Title/Abstract] OR academics[Title/Abstract]

18. 15 OR 16 OR 17

Block 2B: non-financial conflicts of interest

19. Conflict of interest (MeSH)

20. Conflict[Title] OR conflicts[Title] OR conflicting[Title] OR competing[Title] OR vested[Title]

21. Relation[Title] OR relations[Title] OR relationship[Title] OR relationships[Title]

22. Interest[Title] OR interests[Title]

23. 19 OR 20 OR 21 OR 22

Block 3: clinical guidelines, advisory committee reports, opinion pieces, and narrative reviews

24. (Opinion[Title/Abstract] OR opinions[Title/Abstract] OR policy[Title/Abstract] OR policies[Title/Abstract] OR statement[Title/Abstract] OR statements[Title/Abstract]) AND (piece[Title/Abstract] OR pieces[Title/Abstract] OR article[Title/Abstract] OR articles[Title/Abstract])

25. (Narrative[Title/Abstract] OR descriptive[Title/Abstract] OR non-systematic[Title/Abstract] OR non-systematical[Title/Abstract] OR non-systematically[Title/Abstract] OR nonsystematic[Title/Abstract] OR nonsystematical[Title/Abstract] OR nonsystematically[Title/Abstract]) AND (review[Title/Abstract] OR reviews[Title/Abstract] OR overview[Title/Abstract] OR overviews[Title/Abstract])

26. Non[Title/Abstract] AND (systematic[Title/Abstract] OR systematical[Title/Abstract] OR systematically[Title/Abstract]) AND (review[Title/Abstract] OR reviews[Title/Abstract] OR overview[Title/Abstract] OR overviews[Title/Abstract])

27. Editorial[Title] OR editorials[Title] OR essay[Title] OR essays[Title] OR commentary[Title] OR commentaries[Title] OR comment[Title] OR comments[Title] OR letter[Title] OR letters[Title]

28. (Treatment[Title/Abstract] OR treatments[Title/Abstract] OR screening[Title/Abstract] OR screen[Title/Abstract] OR testing[Title/Abstract] OR test[Title/Abstract] OR tests[Title/Abstract OR diagnostic[Title/Abstract] OR diagnosis[Title/Abstract] OR therapy[Title/Abstract] OR therapies[Title/Abstract]) AND (recommendation[Title/Abstract] OR recommendations[Title/Abstract])

29. Guidelines as Topic (MeSH)

30. Health Planning Guidelines (MeSH)

31. (Clinical[Title] OR clinic[Title] OR health[Title] OR practice[Title]) AND (guideline[Title] OR guidelines[Title] OR recommendation[Title] OR recommendations[Title])

32. (Advisory[Title/Abstract] OR advising[Title/Abstract] OR formulary[Title/Abstract] OR counselling[Title/Abstract] OR counselling[Title/Abstract] OR drug[Title/Abstract] OR drugs[Title/Abstract]) AND (board[Title/Abstract] OR boards[Title/Abstract] OR committee[Title/Abstract] OR committees[Title/Abstract] OR panel[Title/Abstract] OR panels[Title/Abstract] OR meeting[Title/Abstract] OR meetings[Title/Abstract])

33. 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32

Combined searches

34. 5 AND 14

35. 18 AND 23

36. (34 OR 35) AND 33

Supplementary appendix 3. Data Extraction

Two review authors independently extracted the following information:

Study characteristics
- Title
- Name of lead author
- Name of journal
- Year published
- Primary aim of the study
- Design of study: cohort, cross-sectional study, systematic review or meta-analysis, or other
- Study domain - category: clinical guideline, advisory committee report, opinion pieces, narrative review, or mixed
- Sample description: for example, clinical guidelines on treatment of hypertension
- Strategy used to collect sample: for example, search of PubMed and time period covered
- Definition of clinical guidelines, advisory committee reports, opinion pieces, or narrative reviews used in the study. Verbatim extraction
- Number of included documents (separate data for clinical guidelines, advisory committee reports, opinion pieces, and narrative reviews)
- Types of documents included in the study. Verbatim extraction
- Types of documents included in the study (drug, device or both)

Conflict of interest and outcome data
- Definition of financial conflicts of interest used in the study. Verbatim extraction
- Definition of non-financial conflicts of interest used in the study. Verbatim extraction
- Types of financial conflicts of interest investigated, potential categories are:
  - Funding;
  - Author grant;
  - Honorarium;
  - Consulting;
  - Speakers bureau;
- Types of non-financial conflicts of interest investigated
- Definition of favourable recommendations used by the authors of the study. Verbatim extraction
- Definition of primary analysis used in the study. Verbatim extraction
- Total number of documents with and without conflicts of interest. Stratified by type of document (i.e. clinical guideline, advisory committee reports, opinion piece, narrative review) and type of conflicts of interest (i.e. financial, non-financial)
- Number of documents with and without conflicts of interest with favourable recommendations stratified by type of documents (i.e. clinical guideline, advisory committee reports, opinion piece, narrative review) and type of conflicts of interest (i.e. financial, non-financial)
- Any data on estimates of the association between financial conflicts of interest/non-financial conflicts of interest and recommendations in clinical guidelines, advisory committee reports, opinion pieces, and narrative reviews (for example, adjusted effect estimates and confidence intervals).

Data for informing subgroup analyses or reflection on heterogeneity
- Total number of documents with conflicts of interest and number with favourable recommendations. Stratified by document type (i.e. clinical guidelines, advisory committee

reports, opinion pieces, narrative reviews) and category of financial conflicts of interest (e.g. investigator, grants, honorarium, consulting, speaker's bureau, equity/stock, gifts)

- Any data on the association between each category of financial conflicts of interest and favourable recommendations
- Total number of clinical guidelines following standardised methods with and without conflicts of interest and number with favourable recommendations. Stratified by type of conflicts of interest (i.e. financial, non-financial)
- Total number of clinical guidelines not following standardised methods with and without conflicts of interest and number with favourable recommendations. Stratified by type of conflicts of interest (i.e. financial, non-financial)
- Any data on the association between conflicts of interest and favourable recommendations for clinical guidelines following standardised methods and clinical guidelines not following standardised methods
- Total number of documents with conflicts of interest and number with favourable recommendations. Stratified by document type (i.e. clinical guidelines, advisory committee reports, opinion pieces, narrative reviews) and degree of financial conflicts of interest (i.e. major and minor)
- Any data on the association between major and minor financial conflicts of interest and favourable recommendations

Data for performing sensitivity analyses
- Total number of documents with and without conflicts of interest and number of documents in each group with favourable recommendations, when excluding documents with unclear or undisclosed conflicts of interest. Stratified by document type (i.e. clinical guidelines, advisory committee reports, opinion pieces, narrative reviews) and type of conflicts of interest (i.e. financial, non-financial)
- Any data on the association between conflicts of interest and favourable recommendations, when excluding documents with unclear or undisclosed conflicts of interest
- Total number of documents with and without conflicts of interest and number of documents in each group with favourable recommendations, when excluding documents with neutral recommendations. Stratified by document type (i.e. clinical guidelines, advisory committee reports, opinion pieces, narrative reviews) and type of conflicts of interest (i.e. financial, non-financial)
- Any data on the association between conflicts of interest and favourable recommendations, when excluding documents with neutral recommendations
- Total number of documents with and without financial conflicts of interest and number of documents in each group with favourable recommendations. Stratified by document type (i.e. clinical guidelines, advisory committee reports, opinion pieces, narrative reviews) and type of financial conflict of interest (i.e. related to the manufacturer or related to any for-profit company)
- Any data on the association between financial conflicts of interest and favourable recommendations. Stratified by type of financial conflict of interest (i.e. related to the manufacturer or related to any for-profit company)

Additional data
- Funding and conflicts of interest statement in the study. Verbatim extraction
- Additional relevant information

Supplementary appendix 4. Dealing with unpublished data

Protocols

We contacted authors in an attempt to obtain published or unpublished protocols for all the studies. All author teams but two responded.[4,5] Nine author teams replied that no protocol was used,[6-14] six author teams replied that they had a protocol, but could not locate or access it,[15-20] and two author teams supplied us with their protocol.[21,22] One author team replied that they had a protocol, but it was incorporated in the study publication,[23] and one author team supplied us with a master thesis that was used as basis of the study.[24] However, in both cases these were in our views not protocols (i.e. a document that details the study rationale and proposed methods written prior to study conduct).[25]

Methodological quality assessment

If the studies did not report their methods in a way that enabled us to conduct our methodological quality assessment, we contacted the authors to clarify these issues. In total, we contacted authors of all the studies and received clarifications for all but two studies.[4,5]

Unpublished data

We contacted the authors of the included studies in an attempt to obtain additional individual study data or summary data in the following cases:

- If the studies included a mixture of documents, but only reported combined data. For example, if a study included clinical guidelines and randomised trials, we contacted the authors to obtain separate data on clinical guidelines.
- If the studies performed unadjusted or adjusted regression analyses, but did not report the raw numbers.
- If the studies extracted information on different types of financial conflicts of interest and/or number of authors with and without financial conflicts of interest in each document, but did not report this information.
- If the studies included documents with undisclosed conflicts of interest and/or neutral recommendations, but did not report this in a separate category.

In total, we contacted authors of 17 studies[4-7,9-15,18-23] and received data for 11 of these studies; eight full data sets[6,7,10,12,13,15,21,23] and in three cases additional summary data.[11,19,20]

When we received unpublished data, we analysed the data according to the methods used in the original studies. For the study on advisory committee reports by Ackerley and colleagues,[13] we restricted the sample for analysis to standing or temporary committee members that participated in the meeting and the voting in line with the authors' analysis.

We included one study that investigated a mixture of opinion pieces and narrative reviews and reported the coding of financial conflicts of interest and recommendations separately for each document, but without specifying the type of document.[14] To enable inclusion in our meta-analyses, two authors (CHN and AL) independently coded the type of documents in the study.

Supplementary appendix 5. Prediction Interval

Formula for prediction interval

We only calculated prediction intervals when at least four studies were included in the pooled analysis, because intervals will be imprecise when the effect estimates are based on only a few studies.[26]

To calculate prediction intervals, we used the formula presented in an article by Riley and colleagues:[27]

$$\hat{u} - t_{k-2} \cdot \sqrt{(\hat{T}^2 + SE(\hat{u})^2)}, \ \hat{u} + t_{k-2} \cdot \sqrt{(\hat{T}^2 + SE(\hat{u})^2)}$$

Where $\hat{u}$ was the estimate of the average effect measure across studies, $SE(\hat{u})$ was the standard error of $\hat{u}$, $\hat{T}$ was the estimate of between study standard deviation, and t_{k-2} was the $100(1-(\alpha/2))$ percentile of the t-distribution with k-2 degrees of freedom, where k was the number of studies in the meta-analysis and α was 0.05 to give a 95% prediction interval. To meet the assumption on normal distribution, the prediction interval was derived on the natural log scale.[27] As T^2 is already a measure for the heterogeneity for ln(RR), this was used directly in the calculation.[26]

Calculation of prediction interval for clinical guidelines

The prediction interval for the risk ratio (RR) of favourable recommendations in clinical guidelines with financial conflicts of interest compared with clinical guidelines without financial conflicts of interest was calculated as: 0.65 to 2.43. Thus, one can expect that clinical guidelines with financial conflicts of interest more often have favourable recommendations compared with clinical guidelines without financial conflicts of interest, but for an individual study of clinical guidelines the association may be reversed.

As our analysis on non-financial conflicts of interest in clinical guidelines was based on only one study, calculation of a prediction interval was only possible for financial conflicts of interest.

Calculation of prediction interval for advisory committee reports

The prediction interval for the RR of favourable recommendations in advisory committee reports with financial conflicts of interest compared with advisory committee reports without financial conflicts of interest was calculated as: 0.66 to 2.19. Thus, one can expect that advisory committee reports with financial conflicts of interest more often have favourable recommendations compared with advisory committee reports without financial conflicts of interest, but for an individual study of advisory committee reports the association may be reversed.

Calculation of prediction interval for opinion pieces

The prediction interval for the RR of favourable recommendations in opinion pieces with financial conflicts of interest compared with opinion pieces without financial conflicts of interest was calculated as: 0.03 to 220.56. Thus, one can expect that opinion pieces with financial conflicts of interest more often have favourable recommendations compared with opinion pieces without financial conflicts of interest, but for an individual study of opinion pieces the association may be reversed.

Calculation of prediction interval for narrative reviews

The prediction interval for the RR of favourable recommendations in narrative reviews with financial conflicts of interest compared with narrative reviews without financial conflicts of interest was calculated as: 0.56 to 2.59. Thus, one can expect that narrative reviews with financial conflicts of interest more often

have favourable recommendations compared with narrative reviews without financial conflicts of interest, but for an individual study of narrative reviews the association may be reversed.

Calculation of prediction interval for combined post-hoc secondary analysis
The prediction interval for the RR of favourable recommendations in documents with financial conflicts of interest compared with documents without financial conflicts of interest was calculated as: 0.88 to 1.80. Thus, one can expect that documents with financial conflicts of interest more often have favourable recommendations compared with documents without financial conflicts of interest, but for an individual study the association may be reversed.

Supplementary appendix 6. Number Needed to Read and additional findings for each document type

Number Needed to Read

For each document type, we calculated a Number Needed to Read as 1/Risk Difference. We calculate the Risk Difference based on the estimates presented in the Summary of Findings table (eAppendix 9). For each estimated Number Needed to Read, we calculated corresponding 95% confidence intervals using the methods described by Altman[28] with Number Needed to Read Favourable (NNRF) representing the expected number of documents with conflicts of interest needed to be read rather than documents without conflicts of interest for one additional document having a favourable recommendation, and Number Needed to Read Unfavourable (NNRU) representing the expected number of documents with conflicts of interest needed to be read rather than documents without conflicts of interest for one additional document having an unfavourable recommendation.

The Number Needed to Read for clinical guidelines was 9.1. The corresponding 95% CI was NNRU 33.3 to ∞ to NNRF 3.4.

The Number Needed to Red for advisory committee reports was 7.7. The corresponding 95% CI was NNRU 100.0 to ∞ to NNRF 3.4.

The Number Needed to Read for opinion pieces was 2.3. The corresponding 95% CI was NNRU 50.0 to ∞ to NNRF 1.4.

The Number Needed to Read for narrative reviews was 8.3. The corresponding 95% CI was NNRU 50.0 to ∞ to NNRF 3.4.

The Number Needed to Read for all document types was 7.1. The corresponding 95% CI was NNRF 20 to NNRF 4.2.

The Number Needed to Read for non-financial conflicts of interest in clinical guidelines was 2.1. The corresponding 95% CI was NNRU 25.0 to ∞ to NNRF 1.75.

Additional findings on financial conflicts of interest in clinical guidelines

Four included studies did not report data in a way that enabled us to include them in our pooled analysis. Two studies each investigated one clinical guideline with financial conflicts of interest and one without. In both of these studies the clinical guidelines with financial conflicts of interest had favourable recommendations, whereas the clinical guidelines without had unfavourable recommendations.[8,24] One study investigated 12 clinical guidelines, but only reported the percentage of authors with financial conflicts of interest in each guideline. Three out of eight clinical guidelines with favourable recommendations included authors with financial conflicts of interest (prevalence from 12% to 53%), and two out of four clinical guidelines with unfavourable recommendations included authors with financial conflicts of interest (prevalence 9% and 11%).[16] The remaining study investigated a mixture of four clinical guidelines, 23 opinion pieces, and 40 reviews (mainly narrative) commenting on a randomised trial on fenofibrate use. The authors found that documents written by authors with conflicts of interest more often recommended fibrate use (RR: 1.69, 95% CI: 1.07 to 2.67).[22]

One of the studies included in our pooled analysis adjusted for the specific drug that was evaluated in the guideline (thereby reducing the risk of confounding). The authors found no association between financial conflicts of interest and recommendations of a drug, but did not report any effect estimates in the study publication.[17]

Additional findings on financial conflicts of interest in advisory committee reports

Two included studies did not report data in a way that enabled us to include them in our pooled analysis. One of the studies investigated the association between conflicts of interest and voting behaviour of 1482 members from 385 advisory committee reports. The authors reported that they found no association between conflicts of interest and voting outcome among members, but did not report any effect estimates on the association between financial conflicts of interest and favourable recommendations.[4] The remaining study investigated 1483 members from 416 advisory committee reports. The authors found that committee members with financial conflicts of interest had 14.3 percent greater odds of voting for approval compared with committee members without financial conflicts of interest. However, the estimate was not statistically significant (p-value: 0.12).[5]

One of the studies included in the pooled analysis adjusted for medical product and advisory committee meeting characteristics (thereby reducing the risk of confounding) and the association between financial conflicts of interest related to the manufacturing company and favourable recommendations was OR: 4.66, 95% CI: 0.64 to 33.6.[12]

Additional findings on financial conflicts of interest in opinion pieces

Two included studies did not report data in a way that enabled us to include them in our pooled analysis. One study investigated a mixture of 69 authors of original research papers, reviews (mainly systematic), and letters. The study found that authors with financial conflicts of interest related to the drug manufacturer more often had favourable recommendations than authors without financial conflicts of interest (RR: 13.91, 95% CI: 1.99 to 96.97).[18] The remaining study investigated a mixture of four clinical guidelines, 23 opinion pieces, and 40 reviews (mainly narrative) commenting on a randomised trial on fenofibrate use. The authors found that documents written by authors with conflicts of interest more often supported continued fibrate use (RR: 1.69, 95% CI: 1.07 to 2.67).[22]

One of the studies included in the pooled analysis adjusted for characteristics of the trial (e.g. type of intervention and trial conclusion) the editorial commented on (thereby reducing the risk of confounding) and the association between financial conflicts of interest and favourable recommendations was OR: 1.39, 95% CI: 0.52 to 3.70.[6]

Additional findings on financial conflicts of interest in narrative reviews

One included study did not report data in a way that enabled us to include it in our pooled analysis. The study investigated a mixture of four clinical guidelines, 23 opinion pieces, and 40 reviews (mainly narrative) commenting on a randomised trial on fenofibrate use. The authors found that documents written by authors with conflicts of interest more often recommended fibrate use (RR: 1.69, 95% CI: 1.07 to 2.67).[22]

Supplementary appendix 7. Subgroup Analyses

Planning of subgroup analyses

We planned to conduct the following pre-planned subgroup analyses for our primary analyses for all document types:

- Documents stratified by different types of financial conflicts of interest (e.g. funding, investigator, author grants, honorarium, consulting, speaker's bureau, equity/stock, or gifts)
- Studies assessed as having adequate methodological quality versus studies assessed as having inadequate methodological quality

We planned to conduct the following pre-planned subgroup analysis for our primary analysis on clinical guidelines only:

- Clinical guidelines developed using standardised methods (e.g. GRADE[29] or US Preventive Services Task Force[30]) versus clinical guidelines not developed using standardised methods. For the stratification of documents, we relied of the coding done by the authors of the included studies

In addition, we planned to conduct the following post-hoc subgroup analysis for our primary analyses:

- Documents stratified by degree of financial conflicts of interest. We compared major financial conflicts of interest (defined as at least half of the authors/committee members having financial conflicts of interest) with minor financial conflicts of interest (defined as less than half of the authors/committee members with financial conflicts of interest). The purpose of this subgroup analysis was to investigate a potential dose-response relationship between financial conflicts of interest and recommendations

We only carried out the subgroup analyses when we had sufficient data (i.e. at least five documents in the group with and without conflicts of interest in the included studies combined).

Findings from subgroup analyses on clinical guidelines

Different types of financial conflicts of interest

Of the four studies included in our pooled analysis on financial conflicts of interest, two studies specified subtypes of financial conflicts of interest.[9,23] We were able to pool data on six different types of financial conflicts of interest: advisory board membership, consultancy, grants, honoraria, industry funding of the clinical guideline, and speaker fees.

We found no difference in recommendations between guidelines with different types of financial conflicts of interest, but estimates were statistically imprecise (p-value for interaction test: 0.95, eFigure 1).

eFigure 1. Subgroup analysis of the association between different types of financial conflicts of interest and favourable recommendations in clinical guidelines

Study or Subgroup	COI Events	COI Total	No COI Events	No COI Total	Weight	Risk Ratio IV, Random, 95% CI
1.1.1 Advisory board membership						
Wang 2010	3	4	0	1	100.0%	2.80 [0.24, 33.04]
Subtotal (95% CI)		4		1	100.0%	2.80 [0.24, 33.04]
Total events	3		0			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.82 (P = 0.41)						
1.1.2 Consultancy						
Wang 2010	3	4	0	1	100.0%	2.80 [0.24, 33.04]
Subtotal (95% CI)		4		1	100.0%	2.80 [0.24, 33.04]
Total events	3		0			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.82 (P = 0.41)						
1.1.3 Grants						
Wang 2010	2	3	0	1	100.0%	2.50 [0.20, 31.00]
Subtotal (95% CI)		3		1	100.0%	2.50 [0.20, 31.00]
Total events	2		0			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.71 (P = 0.48)						
1.1.4 Honoraria						
Wang 2010	3	4	0	1	100.0%	2.80 [0.24, 33.04]
Subtotal (95% CI)		4		1	100.0%	2.80 [0.24, 33.04]
Total events	3		0			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.82 (P = 0.41)						
1.1.5 Industry funding of the clinical guideline						
Aakre 2012	4	4	9	14	100.0%	1.42 [0.88, 2.30]
Subtotal (95% CI)		4		14	100.0%	1.42 [0.88, 2.30]
Total events	4		9			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.42 (P = 0.15)						
1.1.6 Speaker fees						
Wang 2010	3	4	0	1	100.0%	2.80 [0.24, 33.04]
Subtotal (95% CI)		4		1	100.0%	2.80 [0.24, 33.04]
Total events	3		0			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.82 (P = 0.41)						

Test for subgroup differences: Chi² = 1.14, df = 5 (P = 0.95), I² = 0%

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Adequate methodological quality versus inadequate methodological quality

We planned to compare studies having adequate with studies having inadequate methodological quality. However, all four studies included in our pooled analysis on clinical guidelines were assessed as having inadequate methodological quality, and it was not possible to carry out this subgroup analysis.

Clinical guidelines developed using standardised methods versus clinical guidelines not developed using standardised methods

We planned to compare clinical guidelines developed using standardised methods (e.g. through GRADE or US Preventive Services Task Force) with clinical guidelines developed without. Only one of the four studies included in our pooled analysis on financial conflicts of interest in clinical guidelines clearly stated that

included clinical guidelines had to provide documentation that a systematic literature search and review was done.[17] In the remaining three studies, methodological aspects of the included clinical guidelines were not reported and the study samples could potentially be a mixture of clinical guidelines with and without standardised methods. None of the studies had any references to either GRADE or US Preventive Services Task Force. Therefore, our data did not enable us to carry out this subgroup analysis.

Clinical guidelines with major financial conflicts of interest versus clinical guidelines with minor financial conflicts of interest

We were able to assess the number of authors with financial conflicts of interest in each clinical guideline in two studies.[17,23] We found no difference in recommendations between guidelines with major (i.e. at least half of the authors) and minor (i.e. less than half of the authors) financial conflicts of interest, but estimates were statistically imprecise (p-value for interaction test: 0.20, eFigure 2).

eFigure 2. Subgroup analysis of the association between major and minor financial conflicts of interest and favourable recommendations in clinical guidelines

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval; SE: standard error

The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis
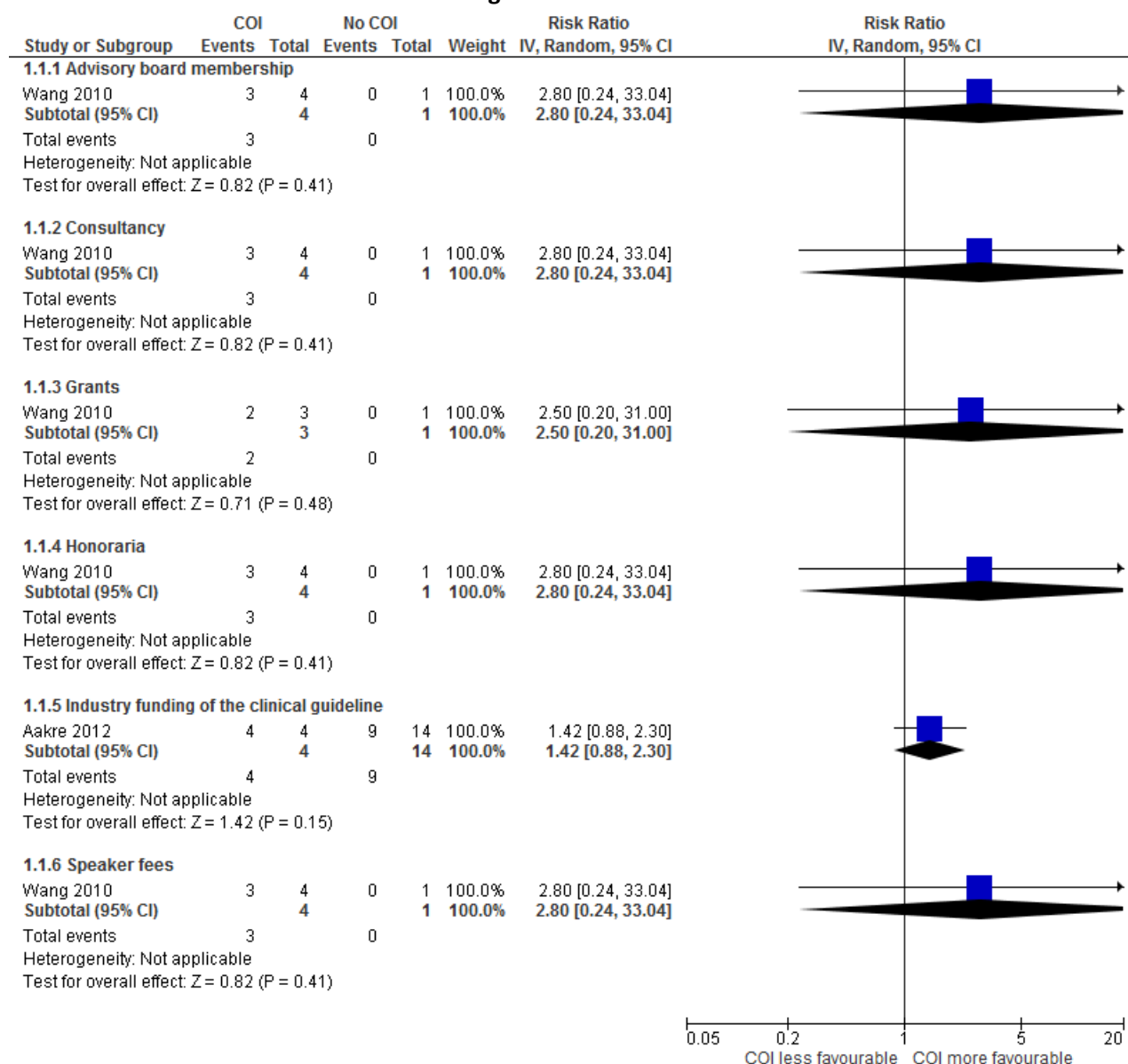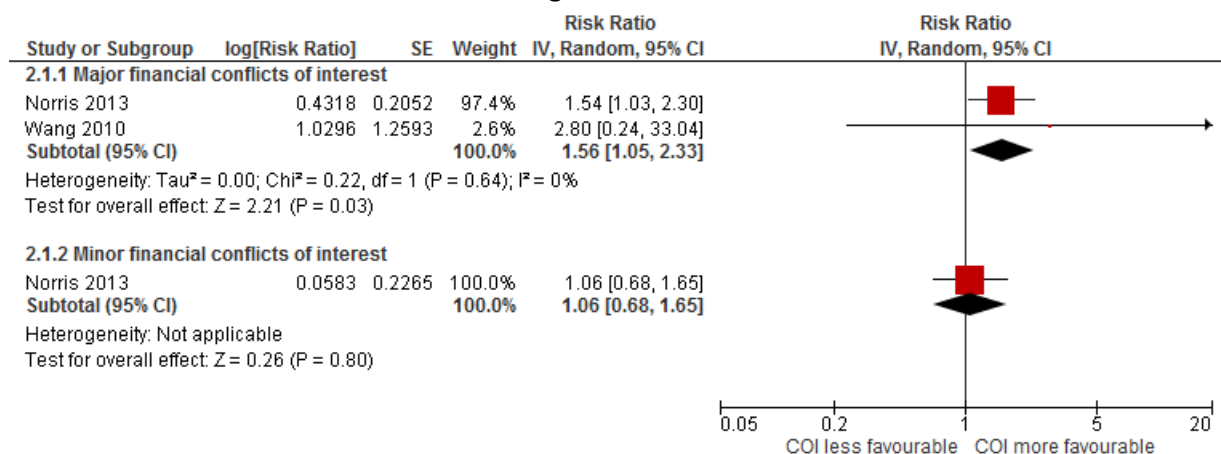
Findings from subgroup analyses on advisory committee reports

Different types of financial conflicts of interest

Of the four studies included in our primary analysis on financial conflicts of interest, one study specified different types of financial conflicts of interest.[13] We were able to pool data on five different types of financial conflicts of interest: consultancy, grants, investments, lecturing and honoraria, and other relationships of committee members (including e.g. patents and expert witness).

We found no difference in recommendations between advisory committee reports with different types of financial conflicts of interest, but estimates were statistically imprecise (p-value for interaction test: 0.82, eFigure 3).

eFigure 3. Subgroup analysis of the association between different types of financial conflicts of interest and favourable recommendations in advisory committee reports

Study or Subgroup	COI Events	Total	No COI Events	Total	Weight	Risk Ratio IV, Random, 95% CI
3.1.1 Consultancy						
Ackerley 2009	30	49	12	28	100.0%	1.43 [0.88, 2.31]
Subtotal (95% CI)		49		28	100.0%	1.43 [0.88, 2.31]
Total events	30		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.45 (P = 0.15)						
3.1.2 Grants						
Ackerley 2009	13	26	12	28	100.0%	1.17 [0.66, 2.07]
Subtotal (95% CI)		26		28	100.0%	1.17 [0.66, 2.07]
Total events	13		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.53 (P = 0.60)						
3.1.3 Investments						
Ackerley 2009	23	36	12	28	100.0%	1.49 [0.91, 2.44]
Subtotal (95% CI)		36		28	100.0%	1.49 [0.91, 2.44]
Total events	23		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.59 (P = 0.11)						
3.1.4 Lecturing and honoraria						
Ackerley 2009	19	25	12	28	100.0%	1.77 [1.10, 2.87]
Subtotal (95% CI)		25		28	100.0%	1.77 [1.10, 2.87]
Total events	19		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.33 (P = 0.02)						
3.1.5 Other relationships						
Ackerley 2009	9	12	12	28	100.0%	1.75 [1.02, 3.00]
Subtotal (95% CI)		12		28	100.0%	1.75 [1.02, 3.00]
Total events	9		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.04 (P = 0.04)						

Risk Ratio IV, Random, 95% CI — scale 0.2, 0.5, 1, 2, 5 — COI less favourable / COI more favourable

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Adequate methodological quality versus inadequate methodological quality

We planned to compare studies having adequate with studies having inadequate methodological quality. However, all four studies included in our pooled analysis on advisory committee reports were assessed as having inadequate methodological quality, and it was not possible to carry out this subgroup analysis.

Advisory committee reports with major financial conflicts of interest versus advisory committee reports with minor financial conflicts of interest

We were able to assess the number of committee members with financial conflicts of interest in each advisory committee report in two studies.[13,21] We found no difference in recommendations between advisory committee reports with major (i.e. at least half of the committee members) and minor (i.e. less than half of the committee members) financial conflicts of interest, but estimates were statistically imprecise (p-value for interaction test: 0.92, eFigure 4).

eFigure 4. Subgroup analysis of the association between major and minor financial conflicts of interest and favourable recommendations in advisory committee reports
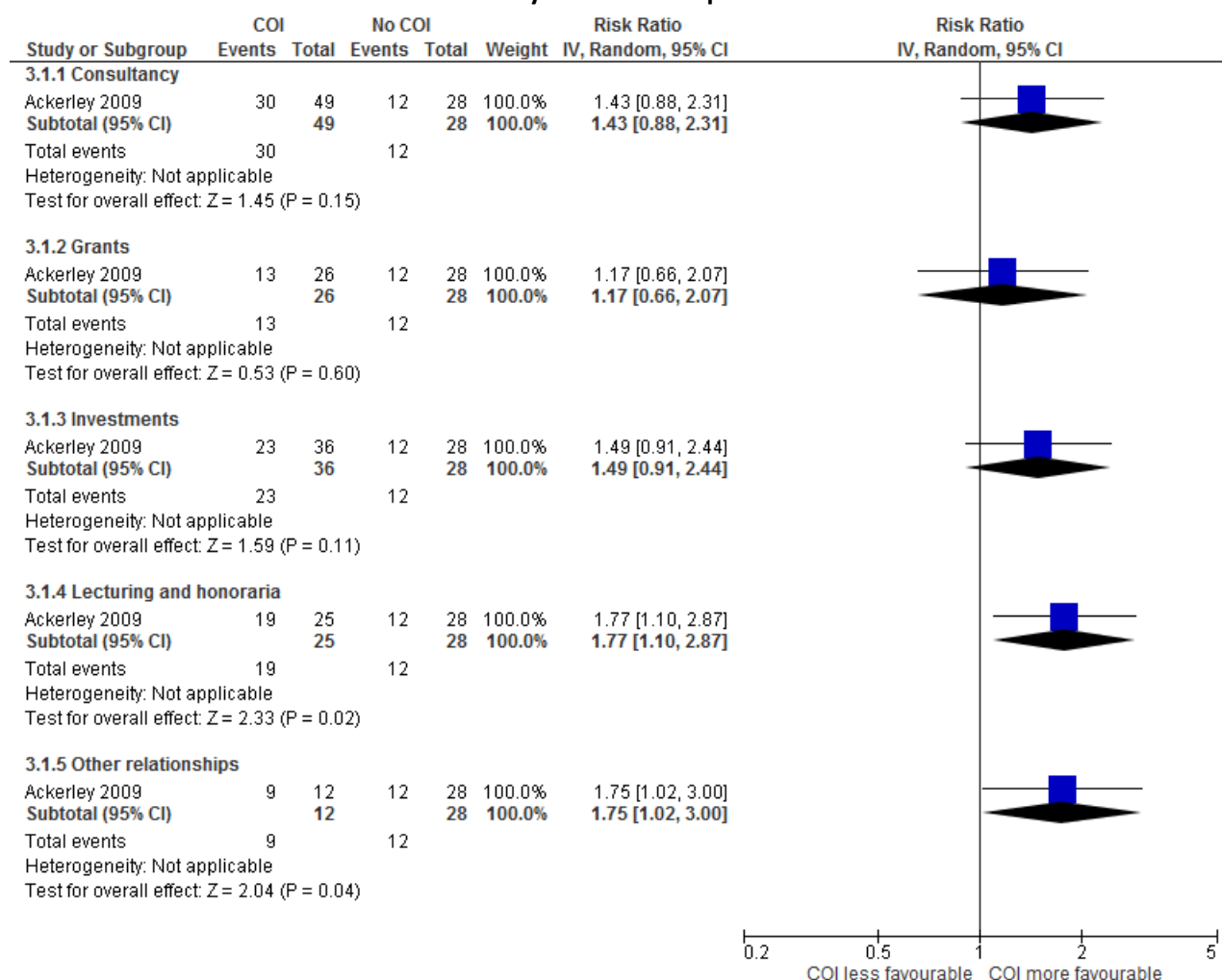

Study or Subgroup	COI Events	Total	No COI Events	Total	Weight	Risk Ratio IV, Random, 95% CI
4.1.1 Major financial conflicts of interest						
Ackerley 2009	39	63	12	28	59.3%	1.44 [0.90, 2.31]
Lurie 2006	5	7	17	31	40.7%	1.30 [0.74, 2.30]
Subtotal (95% CI)		70		59	100.0%	1.38 [0.96, 1.99]
Total events	44		29			
Heterogeneity: Tau² = 0.00; Chi² = 0.08, df = 1 (P = 0.78); I² = 0%						
Test for overall effect: Z = 1.76 (P = 0.08)						
4.1.2 Minor financial conflicts of interest						
Ackerley 2009	5	7	12	28	27.0%	1.67 [0.88, 3.14]
Lurie 2006	26	38	17	31	73.0%	1.25 [0.85, 1.83]
Subtotal (95% CI)		45		59	100.0%	1.35 [0.97, 1.88]
Total events	31		29			
Heterogeneity: Tau² = 0.00; Chi² = 0.58, df = 1 (P = 0.44); I² = 0%						
Test for overall effect: Z = 1.78 (P = 0.07)						

Test for subgroup differences: Chi² = 0.01, df = 1 (P = 0.92), I² = 0%

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis

Findings from subgroup analyses on opinion pieces

Different types of financial conflicts of interest

Three of the four studies included in our pooled analysis on financial conflicts of interest in opinion pieces investigated different types of financial conflicts of interest. We were able to pool data from the studies on eight types of financial conflicts of interest: advisory board membership, consultancy, employment, grants, honoraria, lecture or speaker fees, other relationships (including royalties, testimony, patents, and travel grants), and stock ownership.

We found no difference in recommendations between opinion pieces with different types of financial conflicts of interest, but estimates were statistically imprecise (p-value for interaction test: 0.84, eFigure 5).

eFigure 5. Subgroup analysis of the association between different types of financial conflicts of interest and favourable recommendations in opinion pieces

Study or Subgroup	COI Events	Total	No COI Events	Total	Weight	Risk Ratio IV, Random, 95% CI
5.1.1 Advisory board membership						
Bariani 2013	2	3	35	68	90.0%	1.30 [0.56, 2.98]
Lerner 2012	0	1	6	31	10.0%	1.23 [0.10, 14.94]
Subtotal (95% CI)		4		99	100.0%	1.29 [0.58, 2.84]
Total events	2		41			
Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.97); I² = 0%						
Test for overall effect: Z = 0.63 (P = 0.53)						
5.1.2 Consultancy						
Bariani 2013	17	40	35	68	65.5%	0.83 [0.54, 1.27]
Lerner 2012	6	17	6	31	34.5%	1.82 [0.69, 4.78]
Subtotal (95% CI)		57		99	100.0%	1.09 [0.52, 2.27]
Total events	23		41			
Heterogeneity: Tau² = 0.17; Chi² = 2.16, df = 1 (P = 0.14); I² = 54%						
Test for overall effect: Z = 0.22 (P = 0.83)						
5.1.3 Employment						
Bariani 2013	0	3	35	68	47.0%	0.24 [0.02, 3.28]
Wang 2010	5	6	2	55	53.0%	22.92 [5.61, 93.56]
Subtotal (95% CI)		9		123	100.0%	2.71 [0.03, 231.22]
Total events	5		37			
Heterogeneity: Tau² = 9.20; Chi² = 9.07, df = 1 (P = 0.003); I² = 89%						
Test for overall effect: Z = 0.44 (P = 0.66)						
5.1.4 Grants						
Bariani 2013	22	34	35	68	59.5%	1.26 [0.90, 1.76]
Lerner 2012	5	14	6	31	28.4%	1.85 [0.68, 5.04]
Wang 2010	2	8	2	55	12.2%	6.88 [1.12, 42.19]
Subtotal (95% CI)		56		154	100.0%	1.72 [0.86, 3.46]
Total events	29		43			
Heterogeneity: Tau² = 0.18; Chi² = 3.62, df = 2 (P = 0.16); I² = 45%						
Test for overall effect: Z = 1.53 (P = 0.13)						
5.1.5 Honoraria						
Bariani 2013	8	22	35	68	53.0%	0.71 [0.39, 1.29]
Lerner 2012	6	11	6	31	47.0%	2.82 [1.15, 6.92]
Subtotal (95% CI)		33		99	100.0%	1.35 [0.35, 5.24]
Total events	14		41			
Heterogeneity: Tau² = 0.81; Chi² = 6.31, df = 1 (P = 0.01); I² = 84%						
Test for overall effect: Z = 0.44 (P = 0.66)						
5.1.6 Lecture or speaker fees						
Bariani 2013	2	4	35	68	50.7%	0.97 [0.35, 2.66]
Lerner 2012	1	1	6	31	49.3%	3.69 [1.29, 10.60]
Subtotal (95% CI)		5		99	100.0%	1.88 [0.51, 6.94]
Total events	3		41			
Heterogeneity: Tau² = 0.61; Chi² = 3.22, df = 1 (P = 0.07); I² = 69%						
Test for overall effect: Z = 0.94 (P = 0.35)						
5.1.7 Other relationships						
Bariani 2013	5	10	35	68	94.0%	0.97 [0.50, 1.88]
Lerner 2012	0	2	6	31	6.0%	0.82 [0.06, 11.29]
Subtotal (95% CI)		12		99	100.0%	0.96 [0.51, 1.83]
Total events	5		41			
Heterogeneity: Tau² = 0.00; Chi² = 0.01, df = 1 (P = 0.90); I² = 0%						
Test for overall effect: Z = 0.12 (P = 0.90)						
5.1.8 Stock ownership						
Bariani 2013	2	7	35	68	81.4%	0.56 [0.17, 1.83]
Lerner 2012	0	1	6	31	18.6%	1.23 [0.10, 14.94]
Subtotal (95% CI)		8		99	100.0%	0.64 [0.22, 1.89]
Total events	2		41			
Heterogeneity: Tau² = 0.00; Chi² = 0.32, df = 1 (P = 0.57); I² = 0%						
Test for overall effect: Z = 0.80 (P = 0.42)						

Test for subgroup differences: Chi² = 3.49, df = 7 (P = 0.84), I² = 0%

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis
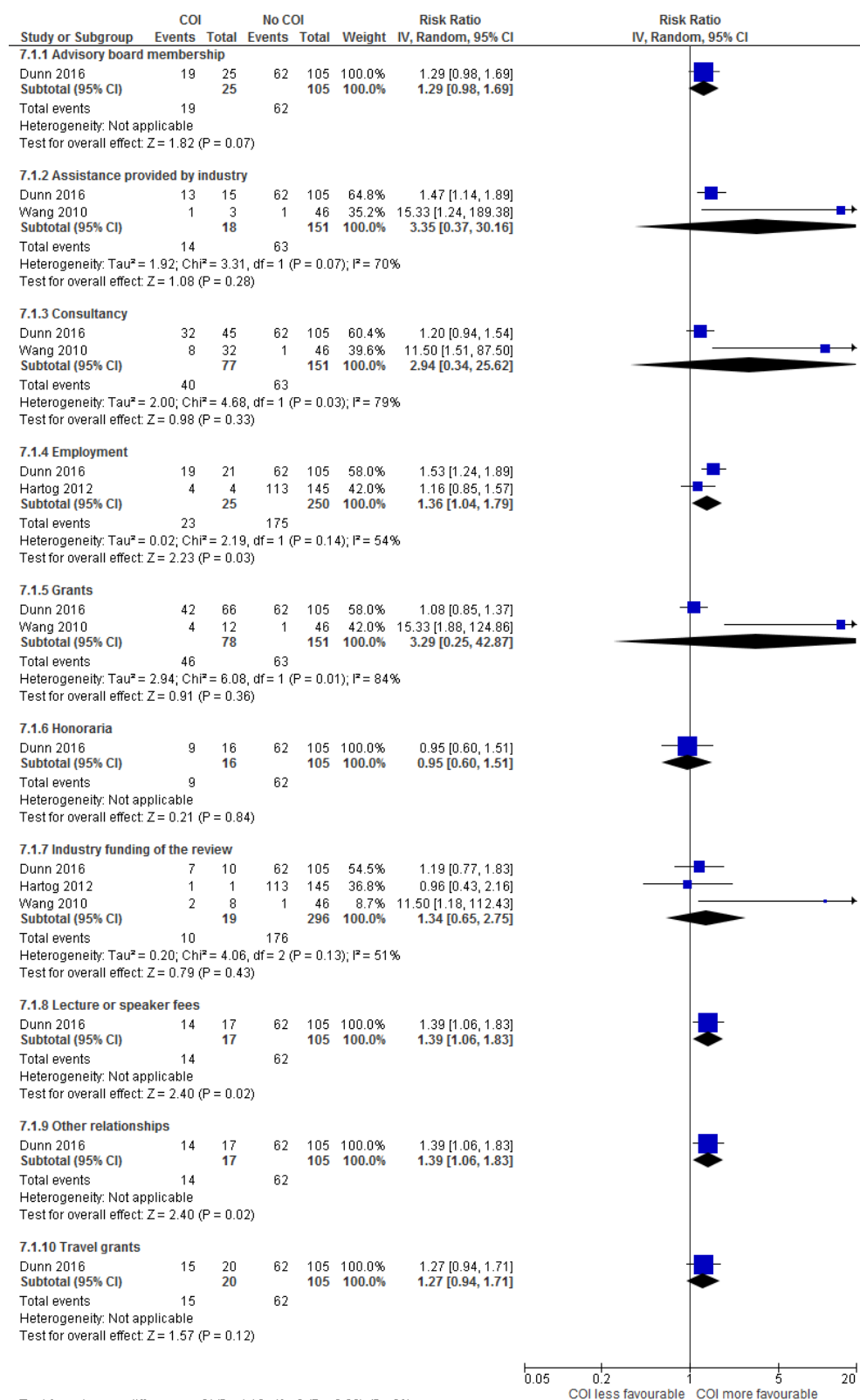
Adequate methodological quality versus inadequate methodological quality

We planned to compare studies having adequate with studies having inadequate methodological quality. However, all four studies included in our pooled analysis on opinion pieces were assessed as having inadequate methodological quality, and it was not possible to carry out this subgroup analysis.

Opinion pieces with major financial conflicts of interest versus opinion pieces with minor financial conflicts of interest

We were able to assess the number of authors with financial conflicts of interest in each opinion piece in one study.[23] We found no difference in recommendations between opinion pieces with major (i.e. at least half of the authors) and minor (i.e. less than half of the authors) financial conflicts of interest, but estimates were statistically imprecise (p-value for interaction test: 0.74, eFigure 6).

eFigure 6. Subgroup analysis of the association between major and minor financial conflicts of interest and favourable recommendations in opinion pieces

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval
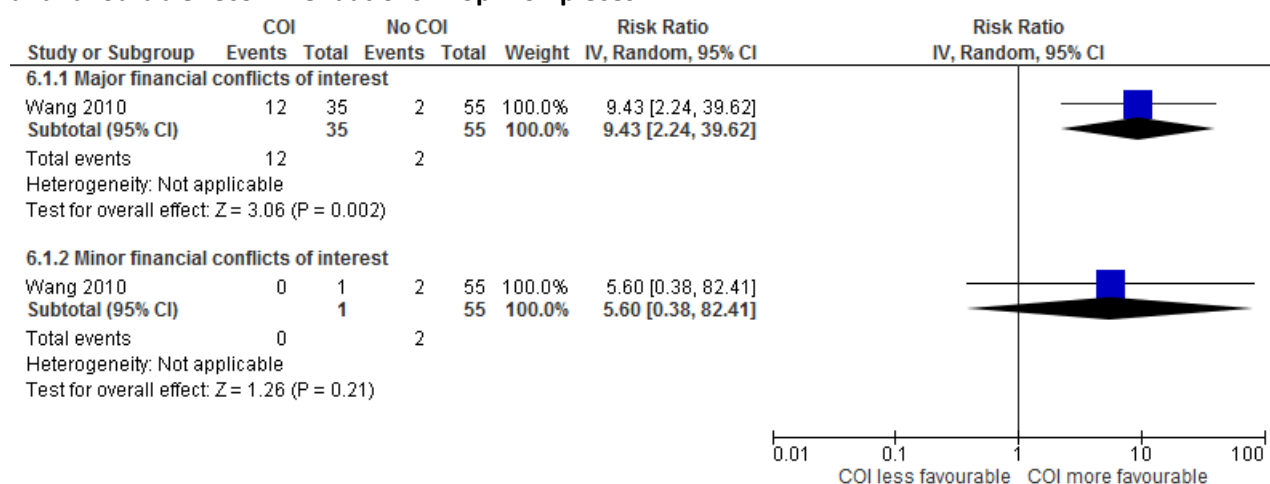
Findings from subgroup analyses on narrative reviews

Different types of financial conflicts of interest

Three of the four studies investigating narrative reviews investigated different types of financial conflicts of interest. We were able to pool data on nine types: advisory board membership, assistance provided by industry, consultancy, employment, grants, honoraria, industry funding of the review, lecture or speaker fees, other relationships of review authors, and travel grants.

We found no difference in recommendations between reviews with different types of financial conflicts of interest, but estimates were statistically imprecise (p-value for interaction test: 0.90, eFigure 7).

eFigure 7. Subgroup analysis of the association between different types of financial conflicts of interest and favourable recommendations in narrative reviews
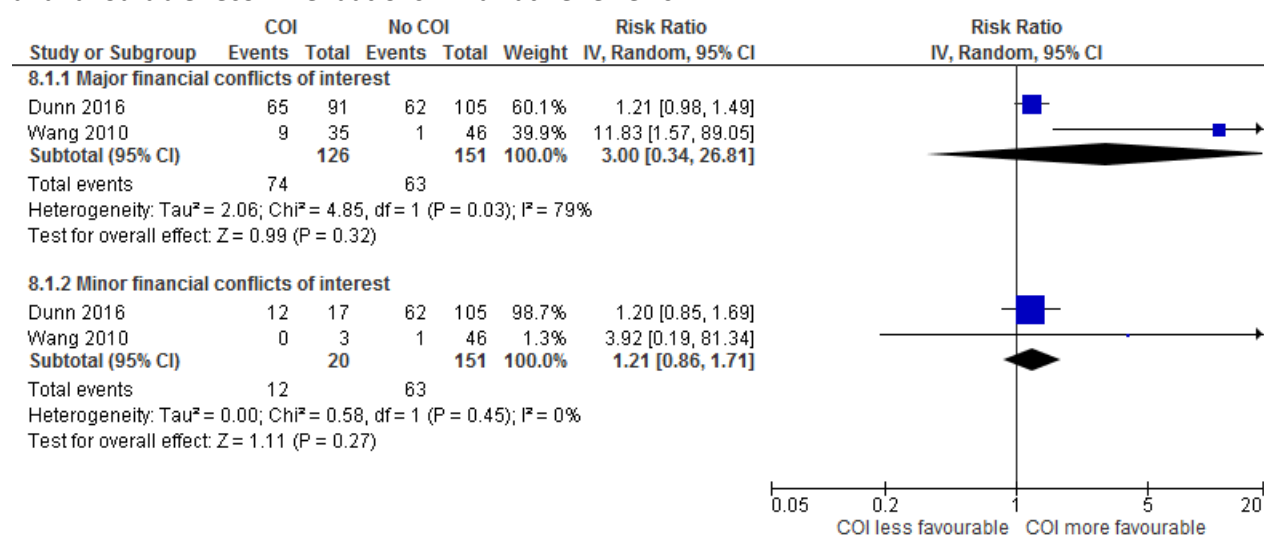

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis

Adequate methodological quality versus inadequate methodological quality

We planned to compare studies having adequate with studies having inadequate methodological quality. However, all four studies included in our pooled analysis on narrative reviews were assessed as having inadequate methodological quality, and it was not possible to carry out this subgroup analysis.

Narrative reviews with major financial conflicts of interest versus narrative reviews with minor financial conflicts of interest

We were able to assess the number of authors with financial conflicts of interest in narrative review in two studies.[7,23] We found no difference in recommendations between reviews with major (i.e. at least half of the authors) and minor (i.e. less than half of the authors) financial conflicts of interest, but estimates were statistically imprecise (p-value for interaction test: 0.42, eFigure 8).

eFigure 8. Subgroup analysis of the association between major and minor financial conflicts of interest and favourable recommendations in narrative reviews

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis

Supplementary appendix 8. Sensitivity Analyses

Planning of sensitivity analyses

We planned to conduct the following pre-planned sensitivity analyses for our primary analyses:

- Excluding documents with unclear or undisclosed conflicts of interest
- Excluding documents with neutral recommendations
- Excluding all studies which disclosed a relevant conflict of interest. For example, if one of the included studies was funded by a drug company, we excluded the study and re-analysed our data
- Re-analysing our primary analyses using a fixed-effect model

In addition, we planned to conduct the following post-hoc sensitivity analysis for our primary analyses:

- Re-categorising documents with financial conflicts of interest into documents with financial conflicts of interest related to the manufacturer of the drug or device of interest or to any for-profit company in two separate analyses

We only carried out the sensitivity analyses, when we had sufficient data (i.e. at least five documents in the group with and without conflicts of interest in the included studies combined).

Findings from sensitivity analyses on clinical guidelines

Excluding clinical guidelines with unclear or undisclosed conflicts of interest

One of the studies included in the pooled analysis on financial conflicts of interest only included clinical guidelines with clear conflicts of interest statements.[17] In the remaining three studies it was not possible to exclude clinical guidelines with unclear or undisclosed conflicts of interest, because reporting of data did not allow it,[19] or the authors did not code this information in their raw datasets.[9,23] In our analysis excluding clinical guidelines with undisclosed financial conflicts of interest, we found somewhat similar results as the primary analysis (from RR: 1.26, 95% CI: 0.93 to 1.69 in the primary analysis to RR: 1.08, 95% CI: 0.71 to 1.64, eFigure 9).

eFigure 9. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in clinical guidelines, when excluding clinical guidelines with unclear or undisclosed financial conflicts of interest
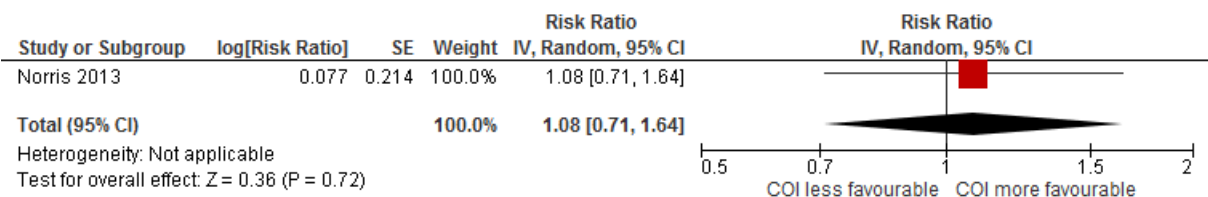
COI: conflicts of interest; IV: inverse-variance; CI: confidence interval; SE: standard error
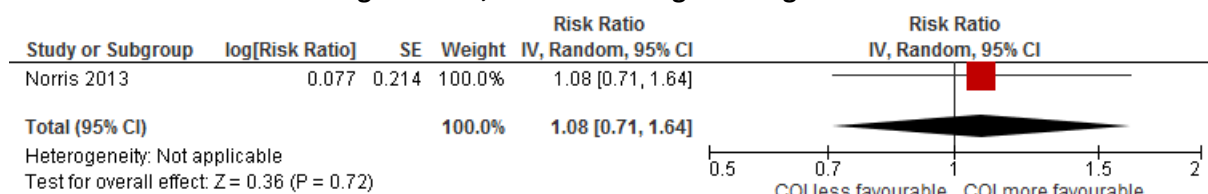
The one study investigating specialist interest included no clinical guidelines with undisclosed speciality of authors.[16]

Excluding clinical guidelines with neutral recommendations

One of the studies included in our pooled analysis on financial conflicts of interest included no clinical guidelines with neutral recommendations.[17] In two studies, the sample did not include any clinical guidelines without favourable recommendations[9] or without conflicts of interest,[23] when we removed

clinical guidelines with neutral recommendations. In the remaining study, it was not possible to remove clinical guidelines with neutral recommendations, because reporting of data did not allow it.[19] Thus, our sensitivity analysis for financial conflicts of interest was based on one study.[17] We found somewhat similar results as our primary analysis (from RR: 1.26, 95% CI: 0.93 to 1.69 in the primary analysis to RR: 1.08, 95% CI: 0.71 to 1.64, eFigure 10).

eFigure 10. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in clinical guidelines, when excluding clinical guidelines with neutral recommendations
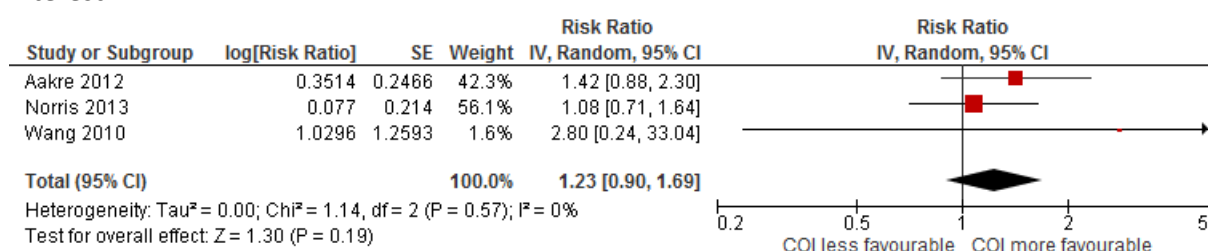
Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Random, 95% CI
Norris 2013	0.077	0.214	100.0%	1.08 [0.71, 1.64]
Total (95% CI)			**100.0%**	**1.08 [0.71, 1.64]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.36 (P = 0.72)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval; SE: standard error

In the one study investigating specialist interest in clinical guidelines, a neutral category was not used for categorising recommendations. Therefore, it was not possible to undertake a sensitivity analysis excluding clinical guidelines with neutral recommendations.[16]

Excluding all studies of clinical guidelines which disclosed a relevant conflict of interest of study authors
One of the studies included in our pooled analysis disclosed financial conflicts of interest of study authors.[19] Excluding this study from our pooled analysis on financial conflicts of interest did not affect our findings (from RR: 1.26, 95% CI: 0.93 to 1.69 in the primary analysis to RR: 1.23, 95% CI: 0.90 to 1.69, eFigure 11).

eFigure 11. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in clinical guidelines, when excluding all studies which disclosed a relevant conflict of interest
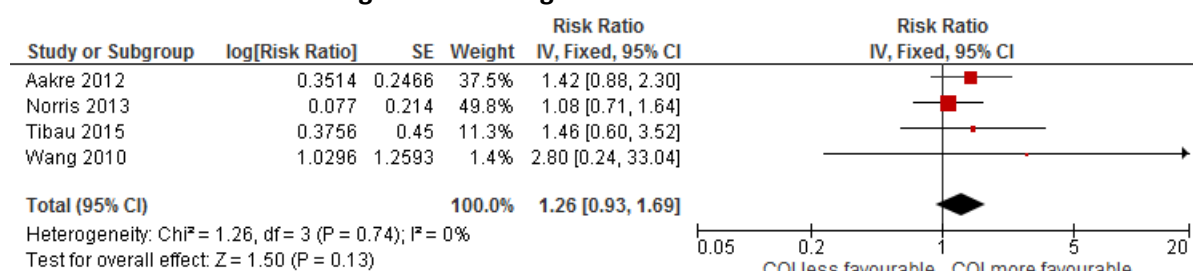
Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Random, 95% CI
Aakre 2012	0.3514	0.2466	42.3%	1.42 [0.88, 2.30]
Norris 2013	0.077	0.214	56.1%	1.08 [0.71, 1.64]
Wang 2010	1.0296	1.2593	1.6%	2.80 [0.24, 33.04]
Total (95% CI)			**100.0%**	**1.23 [0.90, 1.69]**

Heterogeneity: Tau² = 0.00; Chi² = 1.14, df = 2 (P = 0.57); I² = 0%
Test for overall effect: Z = 1.30 (P = 0.19)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval; SE: standard error

The one study investigating specialist interest did not disclose any conflicts of interest of the study authors.[16]

Re-analysing our primary analyses using fixed-effect meta-analyses
Re-analysing our primary analysis using fixed-effect models did not affect our findings on financial conflicts of interest (from RR: 1.26, 95% CI: 0.93 to 1.69 in the primary analysis to RR: 1.26, 95% CI: 0.93 to 1.69, eFigure 12).

eFigure 12. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in clinical guidelines using fixed-effect model
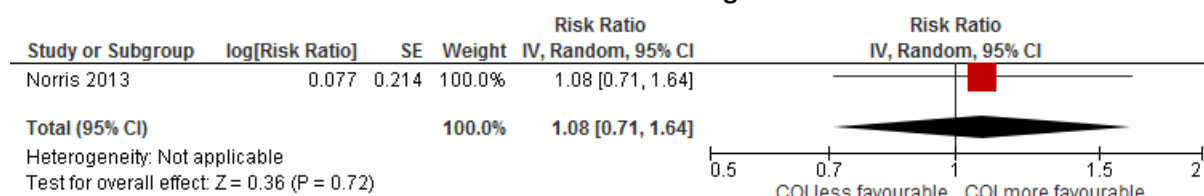
Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Fixed, 95% CI
Aakre 2012	0.3514	0.2466	37.5%	1.42 [0.88, 2.30]
Norris 2013	0.077	0.214	49.8%	1.08 [0.71, 1.64]
Tibau 2015	0.3756	0.45	11.3%	1.46 [0.60, 3.52]
Wang 2010	1.0296	1.2593	1.4%	2.80 [0.24, 33.04]
Total (95% CI)			**100.0%**	**1.26 [0.93, 1.69]**

Heterogeneity: Chi² = 1.26, df = 3 (P = 0.74); I² = 0%
Test for overall effect: Z = 1.50 (P = 0.13)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval; SE: standard error

As only one study was included in our analysis on specialist interest, it was not meaningful to carry out this sensitivity analysis.

Re-categorising financial conflicts of interest into financial conflicts of interest related to the manufacturer and financial conflicts of interest related to any for-profit company
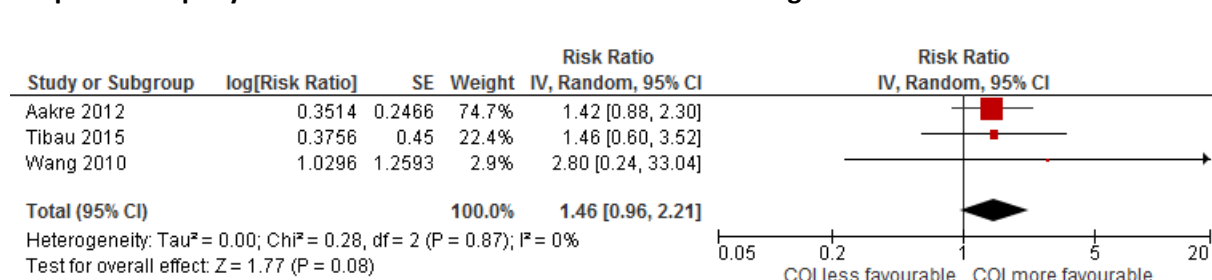
One of the studies included in our pooled analysis measured financial conflicts of interest related to the manufacturer of the investigated drug,[17] whereas three studies measured financial conflicts of interest related to any for-profit company,[9,19] or included only clinical guidelines with financial conflicts of interest related to any for-profit company.[23] Both our sensitivity analyses showed somewhat similar results as our primary analysis (from RR: 1.26, 95% CI: 0.93 to 1.69 in the primary analysis to RR: 1.08, 95% CI: 0.71 to 1.64 for financial conflicts of interest related to the manufacturer, eFigure 13; and to RR: 1.46, 95% CI: 0.96 to 2.21 for financial conflicts of interest related to any for-profit company, eFigure 14).

eFigure 13. Sensitivity analysis of the association between financial conflicts of interest related to the manufacturer and favourable recommendations in clinical guidelines

Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Random, 95% CI
Norris 2013	0.077	0.214	100.0%	1.08 [0.71, 1.64]
Total (95% CI)			**100.0%**	**1.08 [0.71, 1.64]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.36 (P = 0.72)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval; SE: standard error

eFigure 14. Sensitivity analysis of the association between financial conflicts of interest related to any for-profit company and favourable recommendations in clinical guidelines
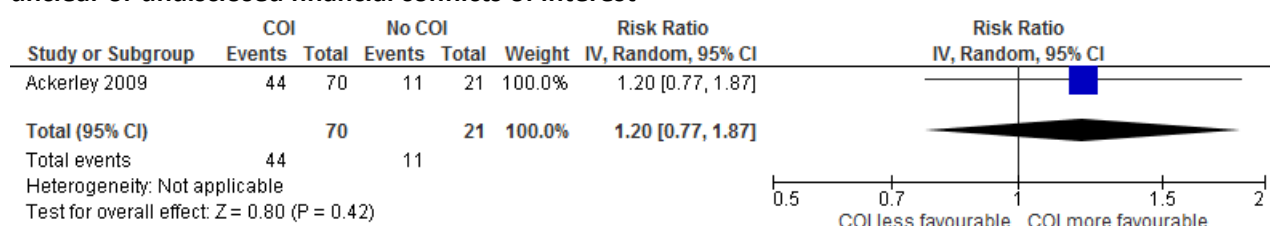
Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Random, 95% CI
Aakre 2012	0.3514	0.2466	74.7%	1.42 [0.88, 2.30]
Tibau 2015	0.3756	0.45	22.4%	1.46 [0.60, 3.52]
Wang 2010	1.0296	1.2593	2.9%	2.80 [0.24, 33.04]
Total (95% CI)			**100.0%**	**1.46 [0.96, 2.21]**

Heterogeneity: Tau² = 0.00; Chi² = 0.28, df = 2 (P = 0.87); I² = 0%
Test for overall effect: Z = 1.77 (P = 0.08)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval; SE: standard error

Findings from sensitivity analyses on advisory committee reports

Excluding advisory committee reports with unclear or undisclosed conflicts of interest

In the three of the four studies included in our pooled analysis on advisory committee reports, it was not possible to remove advisory committee reports with undisclosed conflicts of interest, because the authors did not code this information in their raw dataset[12,21] or reporting of data did not allow it.[20] In the remaining study, we excluded all committee members with unclear conflicts of interest declarations. We found similar results as in our primary analysis (from RR: 1.20, 95% CI: 0.99 to 1.45 in the primary analysis to RR: 1.20, 95% CI: 0.77 to 1.87, eFigure 15)

eFigure 15. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in advisory committee reports, when excluding advisory committee reports with unclear or undisclosed financial conflicts of interest
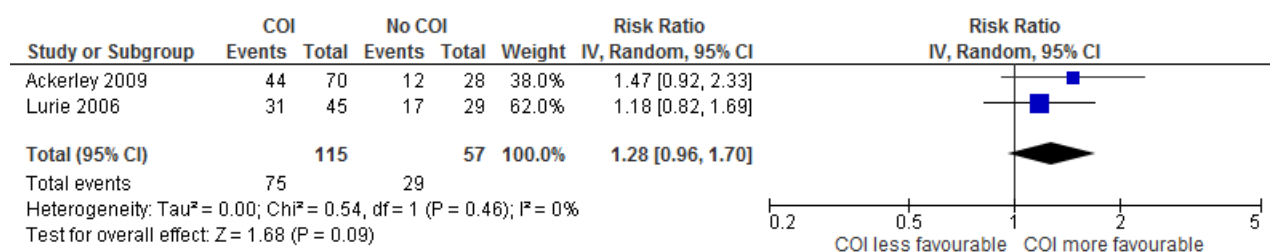
Study or Subgroup	COI Events	Total	No COI Events	Total	Weight	Risk Ratio IV, Random, 95% CI
Ackerley 2009	44	70	11	21	100.0%	1.20 [0.77, 1.87]
Total (95% CI)		70		21	100.0%	1.20 [0.77, 1.87]
Total events	44		11			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.80 (P = 0.42)						

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Excluding advisory committee reports with neutral recommendations

Only one of the studies included in our pooled analysis reported neutral recommendations in a separate category in the primary analysis,[21] and additionally one study coded whether the voting outcome of the meetings were unanimous (but did not include any unanimous meetings).[13] For the remaining studies, the authors did not code neutral recommendations (e.g. unanimous voting outcomes) in their raw dataset[12] or reporting of data did not allow us to exclude advisory committee reports with neutral recommendations.[20] We found somewhat similar results as in our primary analysis (from RR: 1.20, 95% CI: 0.99 to 1.45 in the primary analysis to RR: 1.28, 95% CI: 0.96 to 1.70, eFigure 16).

eFigure 16. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in advisory committee reports, when excluding advisory committee reports with neutral recommendations

Study or Subgroup	COI Events	Total	No COI Events	Total	Weight	Risk Ratio IV, Random, 95% CI
Ackerley 2009	44	70	12	28	38.0%	1.47 [0.92, 2.33]
Lurie 2006	31	45	17	29	62.0%	1.18 [0.82, 1.69]
Total (95% CI)		115		57	100.0%	1.28 [0.96, 1.70]
Total events	75		29			
Heterogeneity: Tau² = 0.00; Chi² = 0.54, df = 1 (P = 0.46); I² = 0%						
Test for overall effect: Z = 1.68 (P = 0.09)						

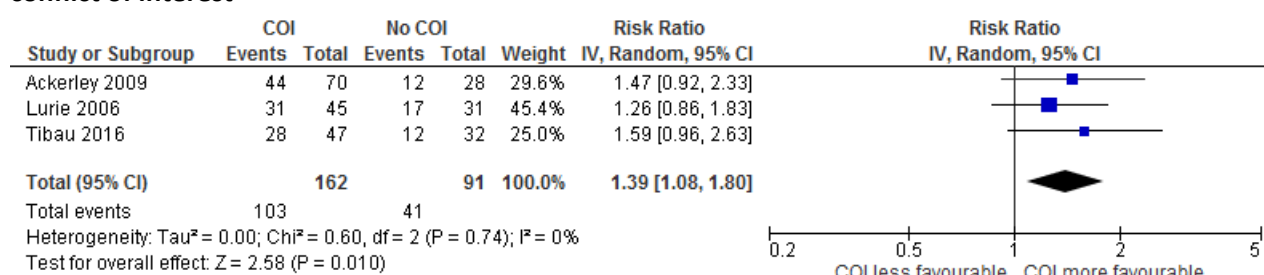*COI: conflicts of interest; IV: inverse-variance; CI: confidence interval*

The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis.

Excluding all studies of advisory committee reports which disclose a relevant conflict of interest of study authors

One of the studies included in our pooled analysis disclosed financial conflicts of interest of study authors.[12] Excluding this study from our pooled analysis on financial conflicts of interest increased the effect estimate and increased statistical precision (from RR: 1.20, 95% CI: 0.99 to 1.45 in the primary analysis to RR: 1.39, 95% CI: 1.08 to 1.80, eFigure 17).

eFigure 17. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in advisory committee reports, when excluding all studies which disclose a relevant conflict of interest
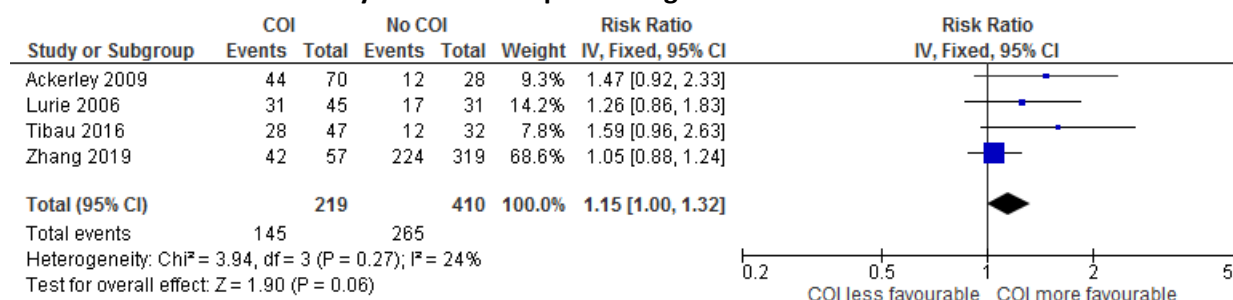

Study or Subgroup	COI Events	COI Total	No COI Events	No COI Total	Weight	Risk Ratio IV, Random, 95% CI
Ackerley 2009	44	70	12	28	29.6%	1.47 [0.92, 2.33]
Lurie 2006	31	45	17	31	45.4%	1.26 [0.86, 1.83]
Tibau 2016	28	47	12	32	25.0%	1.59 [0.96, 2.63]
Total (95% CI)		**162**		**91**	**100.0%**	**1.39 [1.08, 1.80]**
Total events	103		41			

Heterogeneity: Tau² = 0.00; Chi² = 0.60, df = 2 (P = 0.74); I² = 0%
Test for overall effect: Z = 2.58 (P = 0.010)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Re-analysing our primary analyses using fixed-effect meta-analyses

Re-analysing our primary analysis on advisory committee reports using fixed-effect models did not affect our findings (from RR: 1.20, 95% CI: 0.99 to 1.45 in the primary analysis to RR: 1.15, 95% CI: 1.00 to 1.32, eFigure 18).

eFigure 18. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in advisory committee reports using fixed-effect model

Study or Subgroup	COI Events	COI Total	No COI Events	No COI Total	Weight	Risk Ratio IV, Fixed, 95% CI
Ackerley 2009	44	70	12	28	9.3%	1.47 [0.92, 2.33]
Lurie 2006	31	45	17	31	14.2%	1.26 [0.86, 1.83]
Tibau 2016	28	47	12	32	7.8%	1.59 [0.96, 2.63]
Zhang 2019	42	57	224	319	68.6%	1.05 [0.88, 1.24]
Total (95% CI)		**219**		**410**	**100.0%**	**1.15 [1.00, 1.32]**
Total events	145		265			

Heterogeneity: Chi² = 3.94, df = 3 (P = 0.27); I² = 24%
Test for overall effect: Z = 1.90 (P = 0.06)

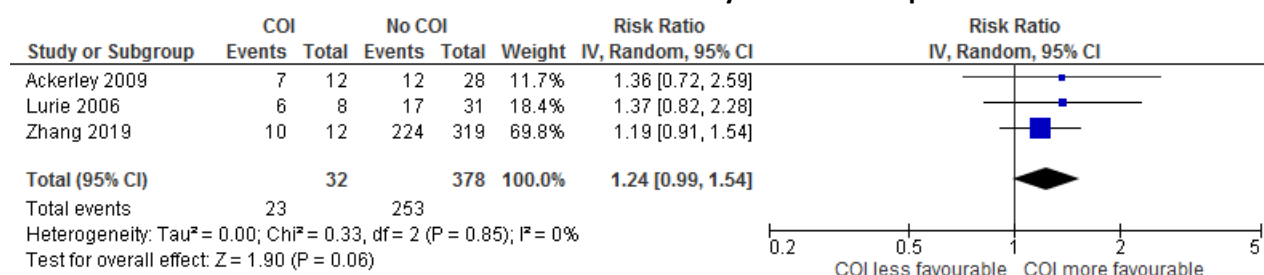*COI: conflicts of interest; IV: inverse-variance; CI: confidence interval*

Re-categorising financial conflicts of interest into financial conflicts of interest related to the manufacturer and financial conflicts of interest related to any for-profit company

The four studies included in our pooled analysis on advisory committee reports both investigated financial conflicts of interest related to the manufacturer of the investigated drug and any for-profit company. One of the studies only reported summary odds ratio (OR) for financial conflicts of interest related to the manufacturer and competitor and was not included in our pooled analysis.[20] Thus, we were able to include data from three studies in our sensitivity analysis restricted to financial conflicts of interest related to the manufacturer.[12,13,21] Our analysis showed similar findings as our primary analysis (from RR: 1.20, 95% CI: 0.99 to 1.45 in the primary analysis to RR: 1.24, 95% CI: 0.99 to 1.54, eFigure 19). The remaining study had

different effect estimates for financial conflicts of interest related to the manufacturer (OR: 1.79, 95% CI: 0.75 to 4.26) and any for-profit company (OR: 1.06, 95% CI: 0.78 to 1.44), though with statistical imprecision.[20]

In our primary analysis, all studies included advisory committee reports with financial conflicts of interest related to any for-profit company (e.g. the manufacturer, competitor, or both) in the financial conflicts of interest group. Thus, we did not perform the sensitivity analysis restricted to any for-profit company as the results would be identical with the primary analysis.

eFigure 19. Sensitivity analysis of the association between financial conflicts of interest related to the manufacturer and favourable recommendations in advisory committee reports
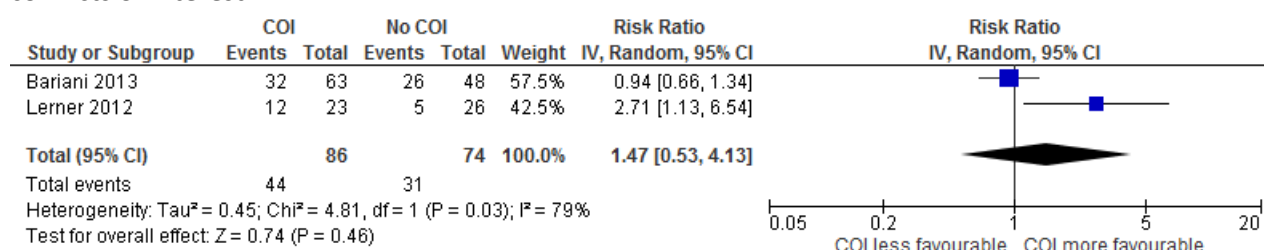
Study or Subgroup	COI Events	COI Total	No COI Events	No COI Total	Weight	Risk Ratio IV, Random, 95% CI
Ackerley 2009	7	12	12	28	11.7%	1.36 [0.72, 2.59]
Lurie 2006	6	8	17	31	18.4%	1.37 [0.82, 2.28]
Zhang 2019	10	12	224	319	69.8%	1.19 [0.91, 1.54]
Total (95% CI)		32		378	100.0%	1.24 [0.99, 1.54]
Total events	23		253			

Heterogeneity: Tau² = 0.00; Chi² = 0.33, df = 2 (P = 0.85); I² = 0%
Test for overall effect: Z = 1.90 (P = 0.06)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Findings from sensitivity analyses on opinion pieces

Excluding opinion pieces with unclear or undisclosed conflicts of interest
Two studies coded opinion pieces with unclear or undisclosed financial conflicts of interest.[6,15] In the remaining studies, it was not possible to separate opinion pieces with unclear or undisclosed financial conflicts of interest, because the authors did not code this information.[14,23] Our sensitivity analysis showed somewhat similar results compared with our primary analysis (from RR: 2.62, 95% CI: 0.91 to 7.55 in the primary analysis to RR: 1.47, 95% CI: 0.53 to 4.13, eFigure 20).

eFigure 20. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in opinion pieces, when excluding opinion pieces with unclear or undisclosed financial conflicts of interest

Study or Subgroup	COI Events	COI Total	No COI Events	No COI Total	Weight	Risk Ratio IV, Random, 95% CI
Bariani 2013	32	63	26	48	57.5%	0.94 [0.66, 1.34]
Lerner 2012	12	23	5	26	42.5%	2.71 [1.13, 6.54]
Total (95% CI)		86		74	100.0%	1.47 [0.53, 4.13]
Total events	44		31			

Heterogeneity: Tau² = 0.45; Chi² = 4.81, df = 1 (P = 0.03); I² = 79%
Test for overall effect: Z = 0.74 (P = 0.46)

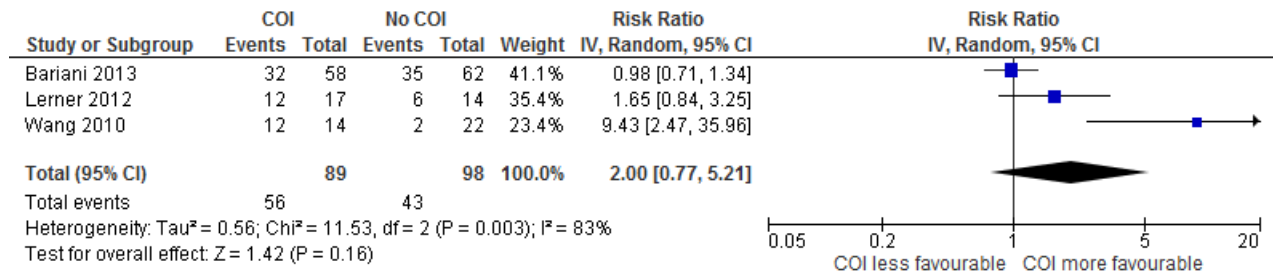*COI: conflicts of interest; IV: inverse-variance; CI: confidence interval*
The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis

Excluding opinion pieces with neutral recommendations
We were able to exclude opinion pieces with neutral recommendations for three studies investigating opinion pieces.[6,15,23] The remaining study did not distinguish between neutral and unfavourable opinion

pieces.[14] An analysis based on these three studies showed somewhat similar results as our primary analysis (from RR: 2.62, 95% CI: 0.91 to 7.55 in the primary analysis to RR: 2.00, 95% CI: 0.77 to 5.21, eFigure 21).

eFigure 21. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in opinion pieces, when excluding opinion pieces with neutral recommendations
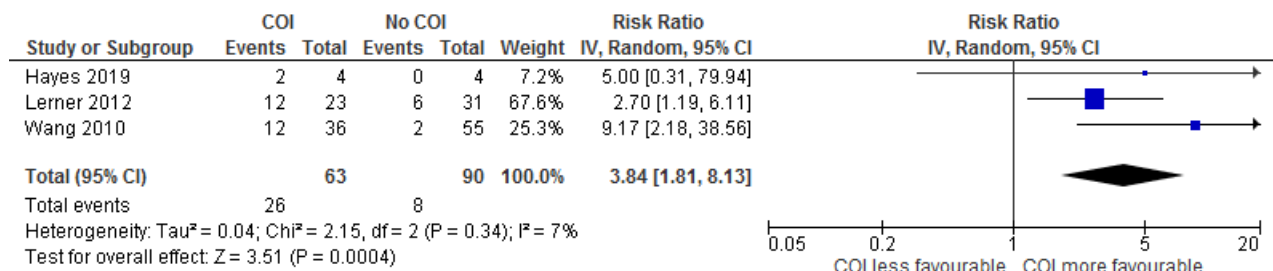

Study or Subgroup	COI Events	COI Total	No COI Events	No COI Total	Weight	Risk Ratio IV, Random, 95% CI
Bariani 2013	32	58	35	62	41.1%	0.98 [0.71, 1.34]
Lerner 2012	12	17	6	14	35.4%	1.65 [0.84, 3.25]
Wang 2010	12	14	2	22	23.4%	9.43 [2.47, 35.96]
Total (95% CI)		89		98	100.0%	2.00 [0.77, 5.21]
Total events	56		43			

Heterogeneity: Tau² = 0.56; Chi² = 11.53, df = 2 (P = 0.003); I² = 83%
Test for overall effect: Z = 1.42 (P = 0.16)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Excluding all studies of opinion pieces which disclose a relevant conflict of interest of study authors
From the four studies included in our primary analysis, one study disclosed financial conflicts of interest of study authors.[6] An analysis excluding this study had somewhat different results than our primary analysis (from RR: 2.62, 95% CI: 0.91 to 7.55 in the primary analysis to RR: 3.84, 95% CI: 1.81 to 8.13, eFigure 22), though the estimate was statistically imprecise.

eFigure 22: Forest plot showing the association between financial conflicts of interest and favourable recommendations in opinion pieces, when excluding all studies which disclosed a relevant conflict of interest


Study or Subgroup	COI Events	COI Total	No COI Events	No COI Total	Weight	Risk Ratio IV, Random, 95% CI
Hayes 2019	2	4	0	4	7.2%	5.00 [0.31, 79.94]
Lerner 2012	12	23	6	31	67.6%	2.70 [1.19, 6.11]
Wang 2010	12	36	2	55	25.3%	9.17 [2.18, 38.56]
Total (95% CI)		63		90	100.0%	3.84 [1.81, 8.13]
Total events	26		8			

Heterogeneity: Tau² = 0.04; Chi² = 2.15, df = 2 (P = 0.34); I² = 7%
Test for overall effect: Z = 3.51 (P = 0.0004)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Re-analysing our primary analyses using fixed-effect meta-analyses
Our re-analysis of our primary analysis using a fixed-effect model showed somewhat similar results as our primary analysis (from RR: 2.62, 95% CI: 0.91 to 7.55 in the primary analysis to RR: 1.27, 95% CI: 0.94 to 1.72, eFigure 23).

eFigure 23. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in opinion pieces using fixed-effect model
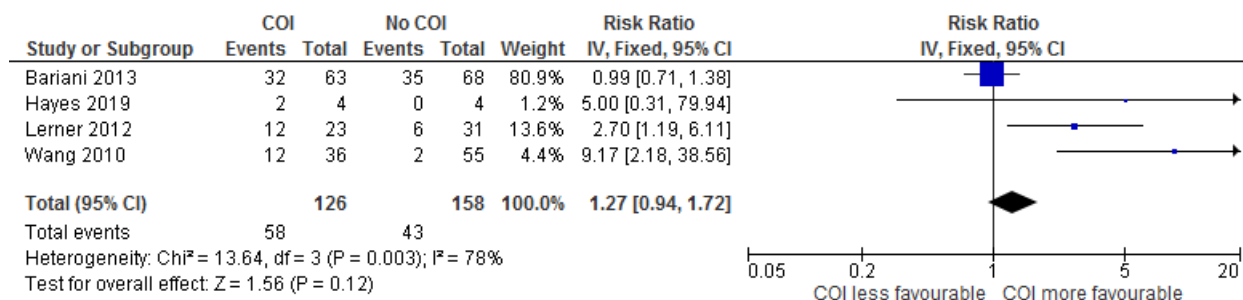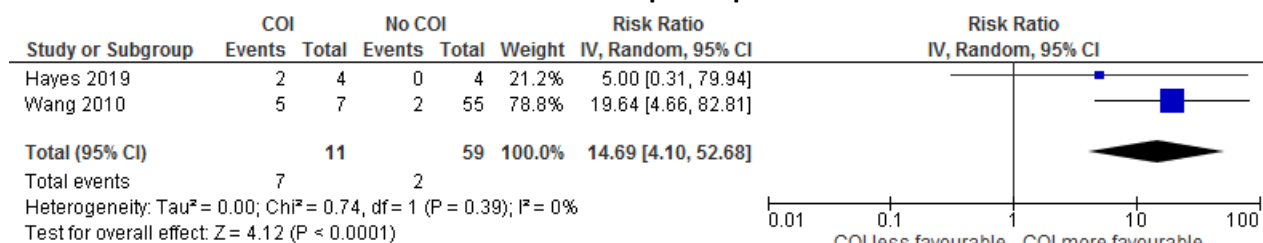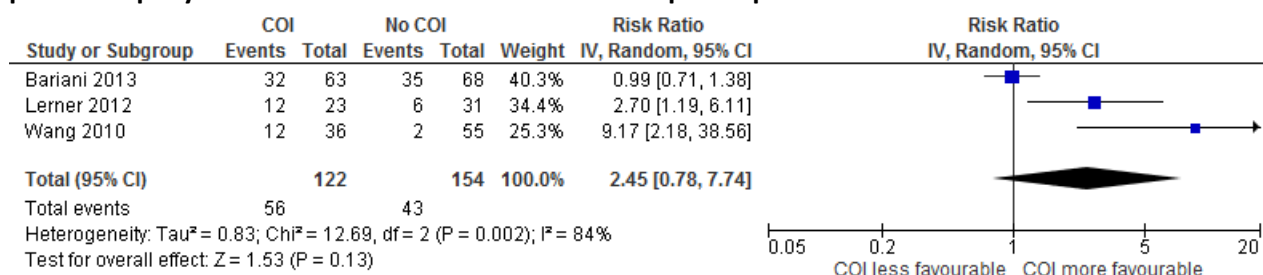
COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Re-categorising financial conflicts of interest into financial conflicts of interest related to the manufacturer and financial conflicts of interest related to any for-profit company

Two of the studies included in our pooled analysis investigated financial conflicts of interest related to the manufacturer of the studied drug or device,[14,15] Our sensitivity analysis restricted to financial conflicts of interest related to the manufacturer showed a stronger association than our primary analysis (from RR: 2.62, 95% CI: 0.91 to 7.55 in the primary analysis to RR: 14.69, 95% CI: 4.10 to 52.68, eFigure 24).

One study solely investigated financial conflicts of interest related to the manufacturer.[14] When we excluded this study from the analysis to include only studies on financial conflicts of interest related to any for-profit companies, we found similar results as our primary analysis (from RR: 2.62, 95% CI: 0.91 to 7.55 in the primary analysis to RR: 2.45, 95% CI: 0.78 to 7.74, eFigure 25)

eFigure 24. Sensitivity analysis of the association between financial conflicts of interest related to the manufacturer and favourable recommendations in opinion pieces

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval
The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis

eFigure 25. Sensitivity analysis of the association between financial conflicts of interest related to any for profit company and favourable recommendations in opinion pieces
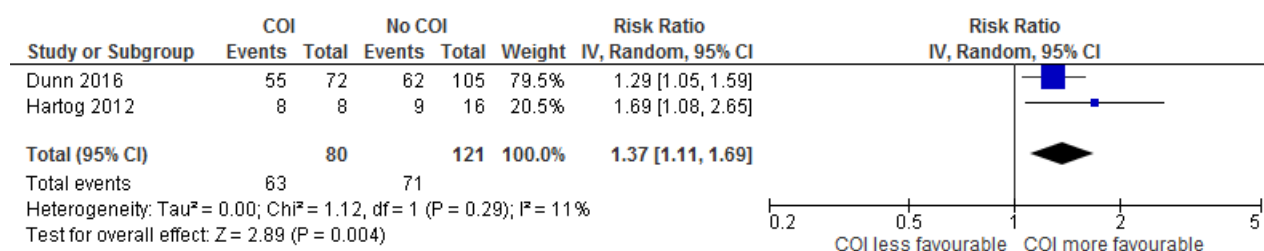

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

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Findings from sensitivity analyses on narrative reviews

Excluding narrative reviews with unclear or undisclosed conflicts of interest
We were able to exclude narrative reviews with unclear of undisclosed conflicts of interest from two studies.[7,10] An analysis based on these two studies had somewhat similar results as our primary analysis (from RR: 1.20, 95% CI: 0.97 to 1.49 in the primary analysis to RR: 1.37, 95% CI: 1.11 to 1.69, eFigure 26).

eFigure 26. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in narrative reviews, when excluding narrative reviews with unclear or undisclosed financial conflicts of interest
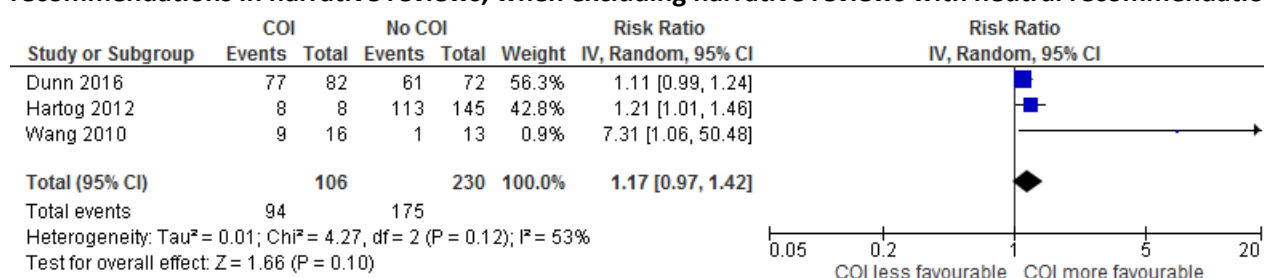

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval
The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis

Excluding narrative reviews with neutral recommendations
We were able to exclude narrative reviews with neutral recommendations from two studies.[7,23] Additionally, one study investigating narrative reviews did not include any narrative reviews with neutral recommendations.[10] The remaining study did not code unfavourable and neutral recommendations separately.[14] Our sensitivity analysis had somewhat similar results as our primary analysis (from RR: 1.20, 95% CI: 0.97 to 1.49 in the primary analysis to RR: 1.17, 95% CI: 0.97 to 1.42, eFigure 27).

eFigure 27. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in narrative reviews, when excluding narrative reviews with neutral recommendations
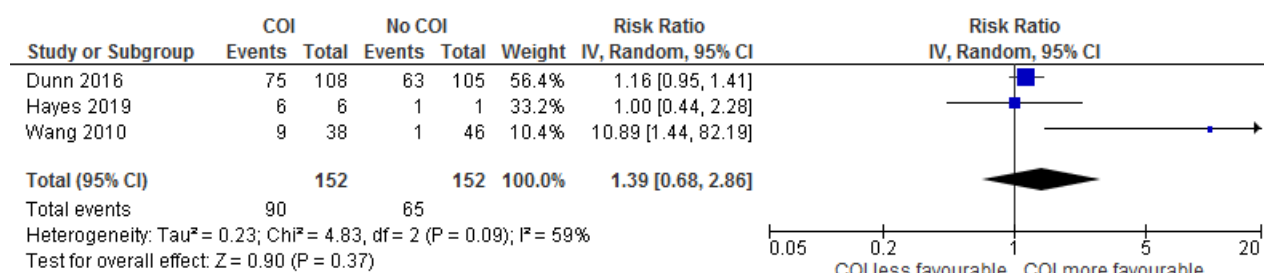

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Excluding all studies of narrative reviews which disclose a relevant conflict of interest of study authors
From the studies included in the pooled analysis, one study disclosed conflicts of interest of study authors.[10] Our analysis excluding this study showed somewhat similar results as our primary analysis (from RR: 1.20, 95% CI: 0.97 to 1.49 in the primary analysis to RR: 1.39, 95% CI: 0.68 to 2.86, eFigure 28).

eFigure 28. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in narrative reviews, when excluding all studies which disclosed a relevant conflict of interest
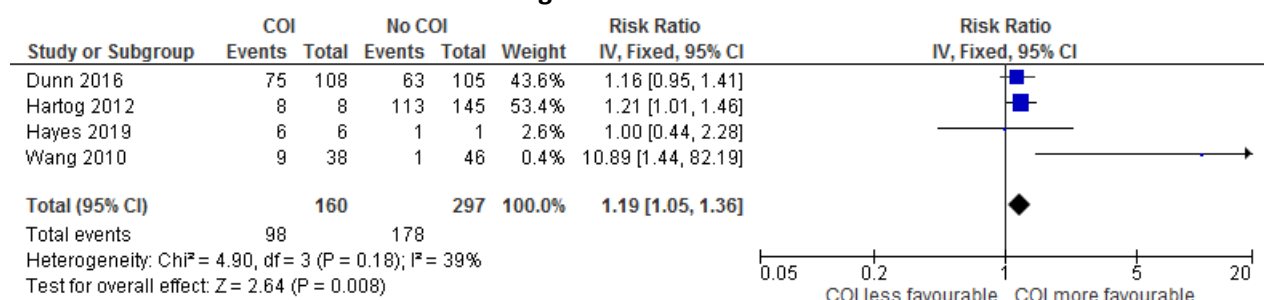
	COI		No COI			Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Dunn 2016	75	108	63	105	56.4%	1.16 [0.95, 1.41]	
Hayes 2019	6	6	1	1	33.2%	1.00 [0.44, 2.28]	
Wang 2010	9	38	1	46	10.4%	10.89 [1.44, 82.19]	
Total (95% CI)		152		152	100.0%	1.39 [0.68, 2.86]	
Total events	90		65				

Heterogeneity: Tau² = 0.23; Chi² = 4.83, df = 2 (P = 0.09); I² = 59%
Test for overall effect: Z = 0.90 (P = 0.37)

0.05　0.2　1　5　20
COI less favourable　COI more favourable

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Re-analysing our primary analyses using fixed-effect meta-analyses

Our re-analysis of our primary analysis on narrative reviews using a fixed-effect model had somewhat similar results compared to our primary analysis (from RR: 1.20, 95% CI: 0.97 to 1.49 in the primary analysis to RR: 1.19, 95% CI: 1.05 to 1.36, eFigure 29).

eFigure 29. Sensitivity analysis of the association between financial conflicts of interest and favourable recommendations in narrative reviews using fixed-effect model
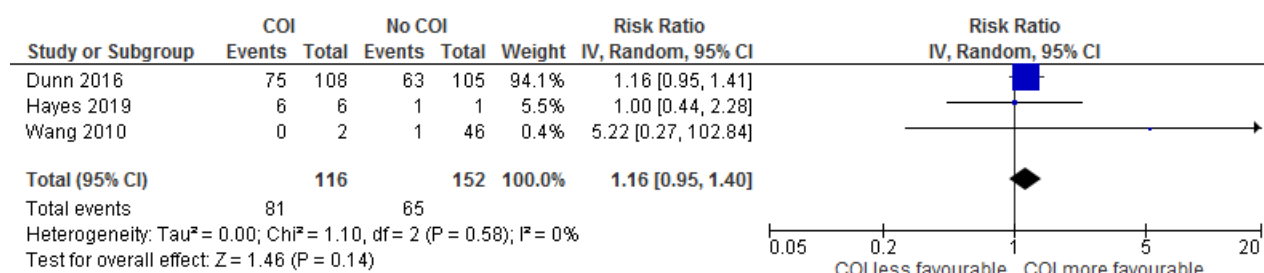
	COI		No COI			Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Dunn 2016	75	108	63	105	43.6%	1.16 [0.95, 1.41]	
Hartog 2012	8	8	113	145	53.4%	1.21 [1.01, 1.46]	
Hayes 2019	6	6	1	1	2.6%	1.00 [0.44, 2.28]	
Wang 2010	9	38	1	46	0.4%	10.89 [1.44, 82.19]	
Total (95% CI)		160		297	100.0%	1.19 [1.05, 1.36]	
Total events	98		178				

Heterogeneity: Chi² = 4.90, df = 3 (P = 0.18); I² = 39%
Test for overall effect: Z = 2.64 (P = 0.008)

0.05　0.2　1　5　20
COI less favourable　COI more favourable

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

Re-categorising financial conflicts of interest into financial conflicts of interest related to the manufacturer and financial conflicts of interest related to any for-profit company
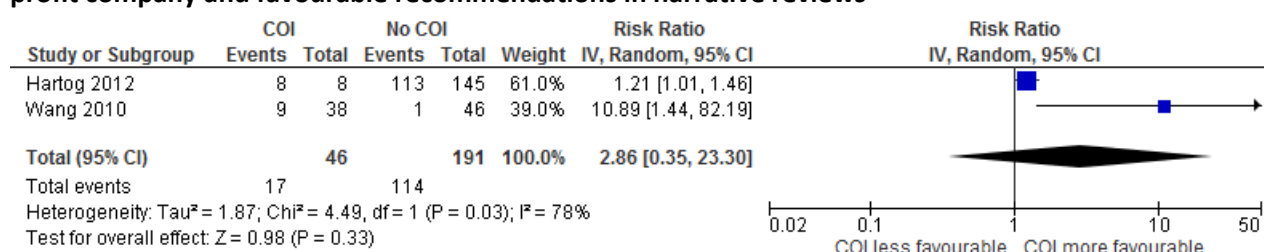
Two of the studies on narrative reviews investigated financial conflicts of interest related to the manufacturer of the drug or device of interest,[7,14] one study investigated financial conflicts of interest related to both the manufacturer and any for-profit company,[23] and the remaining study investigated financial conflicts of interest related to any for-profit company.[10] Both our sensitivity analyses showed somewhat similar results as our primary analysis (from RR: 1.20, 95% CI: 0.97 to 1.49 in the primary analysis to RR: 1.16, 95% CI: 0.95 to 1.40 for financial conflicts of interest related to the manufacturer, eFigure 30; and to: RR: 2.86, 95% CI: 0.35 to 23.30 for financial conflicts of interest related to any for-profit company, eFigure 31).

eFigure 30. Sensitivity analysis of the association between financial conflicts of interest related to the manufacturer and favourable recommendations in narrative reviews

Study or Subgroup	COI Events	COI Total	No COI Events	No COI Total	Weight	Risk Ratio IV, Random, 95% CI
Dunn 2016	75	108	63	105	94.1%	1.16 [0.95, 1.41]
Hayes 2019	6	6	1	1	5.5%	1.00 [0.44, 2.28]
Wang 2010	0	2	1	46	0.4%	5.22 [0.27, 102.84]
Total (95% CI)		**116**		**152**	**100.0%**	**1.16 [0.95, 1.40]**
Total events	81		65			

Heterogeneity: Tau² = 0.00; Chi² = 1.10, df = 2 (P = 0.58); I² = 0%
Test for overall effect: Z = 1.46 (P = 0.14)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

eFigure 31. Sensitivity analysis of the association between financial conflicts of interest related to any for profit company and favourable recommendations in narrative reviews

Study or Subgroup	COI Events	COI Total	No COI Events	No COI Total	Weight	Risk Ratio IV, Random, 95% CI
Hartog 2012	8	8	113	145	61.0%	1.21 [1.01, 1.46]
Wang 2010	9	38	1	46	39.0%	10.89 [1.44, 82.19]
Total (95% CI)		**46**		**191**	**100.0%**	**2.86 [0.35, 23.30]**
Total events	17		114			

Heterogeneity: Tau² = 1.87; Chi² = 4.49, df = 1 (P = 0.03); I² = 78%
Test for overall effect: Z = 0.98 (P = 0.33)

COI: conflicts of interest; IV: inverse-variance; CI: confidence interval

The estimate of heterogeneity should be interpreted with caution as the estimate using a random-effects model is not reliable when only two studies are included in the analysis

Supplementary appendix 9. Summary of findings table

We assessed the certainty of the evidence for our primary outcome using both the GRADE approach for intervention studies[31] (observational studies preliminary graded as providing low certainty evidence) and prognostic studies[32] (observational studies preliminary graded as providing high certainty evidence).

eTable 1. Summary of findings

Document type	Absolute effect (95% CI)[*]		Relative effect RR (95% CI)	Number of studies	Certainty of the evidence using the GRADE approach for intervention studies[**]	Certainty of the evidence using the GRADE approach for prognostic studies[***]
	Event rate in documents with conflicts of interest	Event rate in documents without conflicts of interest				
Financial conflicts of interest						
Clinical guidelines	54 (40 to 72) clinical guidelines with favourable recommendations per 100 clinical guidelines with financial conflicts of interest[****]	43 clinical guidelines with favourable recommendations per 100 clinical guidelines without financial conflicts of interest	**1.26** (0.93 to 1.69)	4 studies including 86 clinical guidelines	**Very low** Downgraded due to study limitations (four studies with inadequate methodological quality) and imprecision (wide confidence interval[****])	**Low**
Advisory committee reports	78 (64 to 94) advisory committee reports with favourable recommendations per 100 advisory committee reports with financial conflicts of interest	65 advisory committee reports with favourable recommendations per 100 advisory committee reports without financial conflicts of interest	**1.20** (0.99 to 1.45)	4 studies including 629 advisory committee reports	**Very low** Downgraded due to study limitations (two studies with inadequate methodological quality) and imprecision (wide confidence interval[****])	**Low**
Opinion pieces	71 (25 to 100[******]) opinion pieces with favourable recommendations per 1000 opinion pieces with financial conflicts of interest	27 opinion pieces with favourable recommendations per 100 opinion pieces without financial conflicts of interest	**2.62** (0.91 to 7.55)	4 studies including 284 opinion pieces	**Very low** Downgraded due to study limitations (three studies with inadequate methodological quality), imprecision (wide confidence interval[****]), and inconsistency (substantial statistical heterogeneity)	**Very low**

	Assumed risk*	Corresponding risk*	Relative effect RR (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE) before** and after***
Narrative reviews	72 (58-89) narrative reviews with favourable recommendations per 100 narrative reviews with financial conflicts of interest	60 narrative reviews with favourable recommendations per 100 narrative reviews without financial conflicts of interest	**1.20** (0.97-1.49)	4 studies including 457 narrative reviews	**Very low** **Low** Downgraded due to study limitations (three studies with inadequate methodological quality) and imprecision (wide confidence interval[*****])
Non-financial conflicts of interest					
Clinical guidelines	90 (39-100[******]) clinical guidelines with favourable recommendations per 100 clinical guidelines with one or more radiology authors	43 clinical guidelines with favourable recommendations per 100 clinical guidelines without radiology authors	**2.10** (0.92-4.77)	1 study including 12 clinical guidelines	**Very low** **Low** Downgraded due to study limitations (one study with inadequate methodological quality) and imprecision (wide confidence interval[*****])

CI: confidence interval; RR: relative risk; GRADE: Grading of Recommendations Assessment, Development and Evaluation

*The event rate of the control group (i.e. no conflicts of interest group) was calculated as the mean risk (i.e. number of documents with favourable recommendations divided by total number of documents). The event rate (and its 95% confidence interval (CI)) in the intervention group (i.e. conflicts of interest group) is based on the assumed risk in the control group and the relative effect of the intervention (and its 95% CI).

**The procedure for assessing the certainty of the evidence followed the GRADE approach for intervention studies (observational studies preliminary graded as providing low certainty evidence).

***The procedure for assessing the certainty of the evidence followed the GRADE approach for prognostic studies (observational studies preliminary graded as providing high certainty evidence).

****Numbers on clinical guidelines do not account for panel data in the Norris 2013 study (i.e. 13 clinical guidelines with 24 recommendations each).

*****We used an effect size of 0.05 on a relative scale (i.e. RR<0.95 or RR>1.05) as a methodologically important difference.[33] This cut-off was based on effect sizes of important study design biases in trials.[34]

******Upper event rate truncated at 100.

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